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

(19) World Intellectual Property Organization
International Bureau

(43) International Publication Date
24 January 2019 (24.01.2019)

WIPO | PCT

(10) International Publication Number
WO 2019/014868 A1

(51) International Patent Classification:
A61Q 5/12 (2006.01) *A61K 8/92* (2006.01)

(21) International Application Number:
PCT/CN2017/093504

(22) International Filing Date:
19 July 2017 (19.07.2017)

(25) Filing Language: English

(26) Publication Language: English

(71) Applicant: **HENKEL (CHINA) INVESTMENT CO., LTD.** [CN/CN]; B1 Building No. 8, Knowledge & Innovation Community (KIC), 398 Songhu Road, Yangpu District, Shanghai 200433 (CN).

(72) Inventors: **HU, Yulan**; B1 Building No. 8, Knowledge & Innovation Community (KIC), 398 Songhu Road, Yangpu District, Shanghai 200433 (CN). **CHANG, Xiaowei**; B1 Building No. 8, Knowledge & Innovation Community (KIC), 398 Songhu Road, Yangpu District, Shanghai 200433 (CN). **SUN, Ruiming**; B1 Building No. 8, Knowledge & Innovation Community (KIC), 398 Songhu Road, Yangpu District, Shanghai 200433 (CN).

(74) Agent: **NTD UNIVATION INTELLECTUAL PROPERTY AGENCY LTD.**; 10th Floor, Tower C, Beijing Global Trade Center, 36 North Third Ring Road East, Dongcheng District, Beijing 100013 (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).

Published:
— *with international search report (Art. 21(3))*

(54) Title: HAIR CONDITIONING COMPOSITION HAVING SNOW-MELTING EFFECT

(57) Abstract: Provided is a hair conditioning composition comprising a thickened hydrophilic phase and a hydrophobic phase containing a solid wax. In particular, the hair conditioning composition exhibits a snow-melting effect, and provides excellent hair conditioning performance.

WO 2019/014868 A1

Hair conditioning composition having snow-melting effect

Technical Field

The present invention relates to a hair conditioning composition comprising a thickened hydrophilic phase and a hydrophobic phase containing a solid wax. In particular, the hair conditioning composition exhibits a snow-melting effect, and provides excellent hair conditioning performance.

Background

Conventional hair conditioning preparations such as rinse-off treatments or leave-on treatments are formulated on the basis of hydrophilic emulsions. To achieve a high level hair conditioning performance, emollients are usually incorporated into the leave-on treatments to smoothen and soften the hair. High melting point emollients together with low melting point emollients or silicone oils, are commonly added into a water based formulation as an oil-in-water (O/W) emulsion system consisting of a aqueous-dispersing-continuous phase and an oily-dispersed-discontinuous phase. A stable O/W emulsion thereof is recognized as the most common approach to deliver the emollients onto the hair evenly.

For example, US 6235275 B1 discloses an oil-in-water composition comprising capryl isostearate as an emollient and an emulsifier, which exhibits characteristics in parity with the cyclomethicones relating to lubricity and "after feel" and which "disappear" from the skin, without exhibiting the untoward safety problems of the cyclomethicones.

US 5997854 A discloses a hair conditioning shampoo composition comprising a quaternary ammonium component, an emulsifier component, an amphoteric surfactant component, and an alkyl polyglycoside, an emollient component, water, anionic surfactant component. It is said that an enhanced conditioning of hair can be obtained in the absence of silicones by the composition.

However, emulsifiers used in those formulations can have negative impact on hair sensory cells and the emulsion stabilization is not always easy to be achieved. In addition, the consumers are tending to find products having attractive appearance and comparable or even better performance than those being currently used.

Summary of the Invention

Based on the foregoing discussion, an object of the present invention is to provide a hair conditioning composition comprising a thickened hydrophilic phase comprising a thickening agent and liquid carrier, a hydrophobic phase comprising a solid wax and a water-insoluble emollient, and having a melting point from 40°C to 65°C, and a hair conditioning agent, in which the hydrophobic phase is suspended in the thickened hydrophilic phase in the form of solid particles.

Also provided is a process for preparing the hair conditioning composition according to the present invention, comprising mixing a thickening agent with a liquid carrier to form a thickened hydrophilic phase, melting a solid wax and a water-insoluble emollient at a temperature from 70 to 100°C to form a hydrophobic phase, cooling down the mixture to 65°C to 70°C, adding the hydrophobic phase into the thickened hydrophilic phase to obtain a homogeneous dispersion with small solid particles while continuous cooling, and adding the hair conditioning agent into the homogeneous dispersion at 40°C to 60°C, and further cooling down to room temperature whilst gently mixing to obtain a hair conditioning composition

These and other objects, features and advantages of the present invention will become better understood upon having reference to the following description of the invention.

Brief Description of the Drawings

Figure 1 is a picture of hair conditioning composition prepared as Example 1, showing the hydrophobic phase in white solid particles suspended in a thickened hydrophilic phase as transparent matrix. The smallest scale in Figure 1 is 1 millimeter (mm).

Detailed Description

It is to be understood by one of ordinary skill in the art that the present application is a description of exemplary embodiments only, and is not intended as limiting the broader aspects of the present invention.

All percentages listed in this specification are percentages of components by weight, unless otherwise specifically mentioned.

In one aspect, the present invention is directed to a hair conditioning composition

comprising a thickened hydrophilic phase comprising a thickening agent and liquid carrier, a hydrophobic phase comprising a solid wax and a water-insoluble emollient, and having a melting point from 40°C to 65°C, and a hair conditioning agent, in which the hydrophobic phase is suspended in the thickened hydrophilic phase in the form of solid particles.

The inventors have surprisingly found that, in the hair conditioning composition of the present invention, the hydrophobic phase comprising a solid wax and a water-insoluble emollient and having a selected melting point range can be evenly suspended/dispersed in the thickened hydrophilic phase in the form of solid particles, and offers an appearance attractive to the consumers due to the suspended solid particles visible by naked eye. In addition, the solid particles in the hair conditioning composition of the present invention quickly melt when the composition is applied onto human palm and gently rubbed by palms, which achieves a “snow-melting” effect to the users and increases the consumers’ interest and attraction in the product of composition.

Thickened hydrophilic phase

According to the present invention, the thickened hydrophilic phase of the hair conditioning composition comprises a thickening agent and liquid carrier. In one embodiment, he thickened hydrophilic phase has a Brookfield viscosity from 5,000 to 50,000 cPs, preferably from 10,000 to 20,000 cPs at room temperature. In another embodiment, the thickened hydrophilic phase has a pH from 3 to 7, preferably from 4 to 5.

The thickening agent is selected from cationic thickening polymer, non-ionic thickening polymer, anionic thickening polymer, amphoteric thickening polymer, and mixture thereof.

Any cosmetically acceptable cationic thickening polymers, which are usually employed in the field of hair cosmetic compositions, may be used as the polymeric thickening agent in the composition of the present invention. A cationic polymer is a polymer having a cationic group such as quaternary ammonium or a group capable of being ionized into a cationic group, such as a primary, secondary or tertiary amine group. The cationic polymer typically is a polymer containing an amine group or an ammonium group in a side chain of the polymer chain, or a polymer including a diallyl quaternary ammonium salt as a constituent unit. Examples of the cationic thickening polymer suitable used in the present invention are cationic cellulose, cationic starch, cationic guar gum, a vinylic or (meth)acrylic polymer or copolymer having quaternary ammonium side chains, (meth)acrylate/aminoacrylate

copolymer, amine substituted polyacrylate crosspolymers, a polymer or copolymer of a diallyl quaternary ammonium salt, and quaternized polyvinylpyrrolidone, or mixture thereof. Preferably, the cationic thickening polymer is selected from cationic cellulose, cationic starch, cationic guar gum, a vinylic or (meth)acrylic polymer or copolymer having quaternary ammonium side chains, and mixture thererof. As an example of the vinylic or (meth)acrylic polymer or copolymer having quaternary ammonium side chains, poly(2-methacryloxyethyltrimethylammonium chloride) (Polyquaternium-37) may be mentioned and is more preferred to be used in the present invention as cationic thickening polymers singly or combined with other cationic thickening polymers. Polyquaternium-37 is commercially available under the name of Cosmedia® Ultragel 300 from BASF.

Any cosmetically acceptable non-ionic thickening polymers, which are usually employed in the field of hair cosmetic compositions, may be used as the polymeric thickening agent in the composition of the present invention. Suitable examples of the non-ionic thickening polymer in the present invention are neutral guar gum, hydroxypropyl guar, cellulose ether and hydrophobically modified derivative thereof, starch, dextrin, or mixture thereof. As examples of cellulose ether, cellulose ethers such as hydroxyethylcellulose, methyl hydroxyethylcellulose, ethyl hydroxyethylcellulose, methyl ethyl hydroxyethylcellulose, hydroxypropylcellulose, hydroxypropylmethylcellulose may be mentioned. As examples of hydrophobically modified derivatives thereof, hydroxyl methyl hydroxyethylcellulose HM-EHEC, starch and dextrins may be mentioned. Preferably, the non-ionic thickening polymer is selected from neutral guar gum, cellulose ether, and mixture thereof. More preferably the non-ionic thickening polymer is hydroxyethyl cellulose ether, such as that sold under the name of Natrosol 250 HR from Ashland.

Any cosmetically acceptable anionic thickening polymers, which are usually employed in the field of hair cosmetic compositions, may be used as the polymeric thickening agent in the composition of the present invention. Suitable examples of the anionic thickening polymer are anionic polysaccharide and derivative thereof, anionic gum, anionic cellulose derivative, and mixture thereof. As examples of anionic polysaccharide and derivative thereof, alginate, pectin, hyaluronate may be mentioned. As examples of anionic gum, xanthan gum, dehydroxanthan gum, hydroxypropyl xanthan gum, gum arabic, gum karaya or gum tragacanth may be mentioned. As an example of anionic cellulose derivative, carboxymethyl cellulose may be mentioned.

Any cosmetically acceptable amphoteric thickening polymers, which are usually employed

in the field of hair cosmetic compositions, may be used as the polymeric thickening agent in the composition of the present invention. The amphoteric polymer contains both, cationic and anionic groups. From a structural point of view, the amphoteric polymer may be derived from any of the described cationic polymer types by the additional introduction of anionic groups or co-monomers. Suitable examples of the amphoteric thickening polymer are carboxyl-modified cationic polysaccharide, sulfonate-modified cationic polysaccharide, copolymers of cationic vinylic monomers with (meth)acrylic acid, copolymers of cationic (meth)acrylic monomers with (meth)acrylic acid, such as dimethyldiallylammonium chloride/acrylic acid copolymer (Polyquaternium-22), and mixture thereof.

Preferably, the thickening agent is a mixture of cationic thickening polymer and non-ionic thickening polymer, and more preferably, the thickening agent is a mixture of Polyquaternium-37 and hydroxyethylcellulose.

According to the present invention, the thickening agent is present in an amount of 0.01 to 5% by weight, preferably 0.1 to 2% by weight based on the total weight of the hair conditioning composition.

The liquid carrier contained in the thickened hydrophilic phase of the hair conditioning composition may be selected from water, alkanol having from 1 to 6 carbon atoms, carbitol, acetone, and mixtures thereof. Among alkanol having from 1 to 6 carbon atoms, preferred for use in the present compositions are monohydric alcohols having from 2 to 4 carbon atoms such as ethanol, isopropanol and mixtures thereof. In general, water may be absent from the liquid carrier or may comprise all of the liquid carrier. In one embodiment, the liquid carrier is a mixture of water and one or two solvents selected from monohydric alcohols having from 2 to 4 carbon atoms, carbitol, and acetone.

According to the present invention, the liquid carrier is present in an amount of 0.01 to 95% by weight, preferably 40 to 90% by weight based on the total weight of the hair conditioning composition.

Hydrophobic phase

According to the present invention, the hydrophobic phase of the hair conditioning composition comprises a solid wax and a water-insoluble emollient, and has a melting point from 40°C to 65°C, preferably from 45°C to 60°C. Although not wishing to be bound by any

theory, it is believed that the snow-melting effect/feeling of the composition is achieved by the hydrophobic phase as a whole, which has a suitable range of melting point conferred by the combination of solid wax, water-insoluble emollient and optional component.

As used herein, the term "solid wax" includes, but is not limited to, any hydrophobic material that is solid and insoluble in water at 25° C, and exhibits a reversible solid/liquid state change, and, in the solid state, an anisotropic crystalline organization. By taking the solid wax to its melting temperature, it is possible to make it miscible with oils and to form a microscopically homogeneous mixture, but, by taking the temperature of the mixture to the ambient temperature, recrystallization of the solid wax from the oils of the mixture takes place.

The solid wax useful in the present invention is not limited, but includes natural wax, synthetic wax, silicone wax, triglyceride or mixtures thereof.

Non-limiting examples of suitable natural waxes include *Abies* Alba Leaf Wax, *Acacia Dealbata* Leaf Wax, *Acacia Farnesiana* Flower Wax, Beeswax, Ceresin, Cetyl Esters, *Cistus Labdaniferus* Flower Wax, *Aurantium Amara* (Bitter Orange) Flower Wax, *Aurantium Dulcis* (Orange) Peel Wax, *Copernicia Cerifera* (Carnauba) Wax, *Eclipta Prostrata* Wax, *Euphorbia Cerifera* (Candelilla) Wax, *Helichrysum Angustifolium* Wax, *Jasminum Officinale* (Jasmine) Flower Wax, *Jasminum Sambac* (Jasmine) Flower Wax, Jojoba Esters, Jojoba Wax, Lanolin Wax, *Lavandula Angustifolia* (Lavender) Flower Wax, *Lawsonia Inermis* Wax, Mink Wax, Montan Acid Wax, Montan Wax, *Myrica Cerifera* (Bayberry) Fruit Wax, *Ocimum Tenuiflorum* Wax, Olive Wax, *Oryza Sativa* (Rice) Bran Wax, Ouricury Wax, Palm Kernel Wax, *Persea Gratissima* (Avocado) Wax, *Pistacia Lentiscus* Leaf Wax, *Polianthes Tuberosa* Flower Wax, *Pyrus Malus* (Apple) Peel Wax, *Ribes Nigrum* (Black Currant) Wax, *Rosa Centifolia* Flower Wax, *Salvia Sclarea* (Clary) Wax, Shellac Wax, *Simmondsia Chinensis* (Jojoba) Butter, Soft Olive Wax, Spent Grain Wax, *Stipa Tenacissima* Wax, Sunflower Seed Wax, Vegetable Wax, *Vitis Vinifera* (Grape) Leaf Wax and mixtures thereof. Preferred is selected from carnauba wax, such as that sold under the name of Carnaubawachs prima gelb, beeswax, such as that sold under the name of Bienenwachs weiss 8108, and mixture thereof.

Non-limiting examples of suitable synthetic waxes include Hydrogenated Japan Wax, Hydrogenated Jojoba Oil, Hydrogenated Jojoba Wax, Hydrogenated Microcrystalline Wax, Hydrogenated Rice Bran Wax, Hydrolyzed Beeswax, Microcrystalline Wax, Paraffin

Oxidized Beeswax, Oxidized Microcrystalline Wax, Ozokerite, , PEG-6 Beeswax, PEG-8 Beeswax, PEG-12 Beeswax, PEG-20 Beeswax, PEG-12 Carnauba, Potassium Oxidized Microcrystalline Wax, Sulfurized Jojoba Oil, Synthetic Beeswax, Synthetic Candelilla Wax, Synthetic Carnauba, Synthetic Japan Wax, Synthetic Jojoba Oil, Synthetic Wax and mixtures thereof. Preferred is a mixture of microcrystalline wax and paraffin, such as that sold under the name of Paracera W 80 by Paramelt.

Non-limiting examples of suitable silicone waxes include DC2503 Cosmetic Wax, DC580 wax, DC AMS-C30 Cosmetic Wax, C30-45 Alkyl Methicone, DC Silkywax 10, Hexamethyldisiloxane, DC ST-Wax 30, C30-45 Alkyldimethylsilyl Polypropylsilsesquioxane, DC SW-8005 resin wax, C_{26-28} Alkyl Dimethicone, C_{26-28} Alkyl Methicone, Polyphenylsilsesquioxane and mixtures thereof.

Non-limiting examples of suitable triglycerides include Butter, *Butyrospermum Parkii* (Shea Butter, such as Cetiol SB 45 sold by BASF), *Theobroma Cacao* (Cocoa) Seed Butter, Cocoa Butter, Hydrogenated Shea Butter, Hydrogenated Cocoa Butter, *Irvingia Gabonensis* Kernel Butter, Tallow, Lard, *Mangifera Indica* (Mango) Seed Butter, Kokum Butter and mixtures thereof.

Preferably, the solid wax in the hydrophobic phase is selected from paraffin wax, microcrystalline wax, beeswax, carnauba wax, the derivatives thereof, and mixture thereof.

According to one particular embodiment, the solid wax in the hydrophobic phase has a melting point of no less than 60°C, preferably from 60°C to 100°C.

According to the present invention, the solid wax is present in an amount of 0.01 to 30% by weight, preferably 1 to 15% by weight based on the total weight of the hair conditioning composition.

In the present invention, the water-insoluble emollient is selected from liquid water-insoluble emollient, semi-solid water-insoluble emollient, and mixture thereof. The liquid water-insoluble emollient is selected from volatile hydrocarbon oil, non-volatile hydrocarbon oil, and mixture thereof.

The semi-solid water-insoluble emollient is selected from shea butter and the derivatives thereof, aliphatic acid ester of acid having 12 to 18 carbon atoms and alcohol having 12 to

18 carbon atoms, and mixture thereof. Suitable examples of the semi-solid water-insoluble emollient are those having a melting point of 30°C to 60°C, preferably from 40°C to 55°C.

Shea butter and the derivatives thereof, such as modified shea butter, are commercially available from BASF under the tradename of CETIOL® SB 45 or CETIOL® SBE.

As examples of aliphatic acid esters of acid having 12 to 18 carbon atoms and alcohol having 4 to 18 carbon atoms, Specific examples of such ester are stearyl laurate, cetyl laurate, myristyl laurate, stearyl myristate, cetyl myristate, myristyl myristate, stearyl palmitate, cetyl palmitate, myristyl palmitate, lauryl palmitate, cetyl stearate, myristyl stearate, lauryl stearate, lauryl myristate, lauryl laurate, and the like. These esters may be used alone or as a mixture.

If present, the semi-solid water-insoluble emollient is present in an amount of 0.05 to 10% by weight, preferably 0.1 to 5% by weight based on the total weight of the hair conditioning composition.

As examples of the volatile hydrocarbon oils, volatile linear alkane oil having from 7 to 16 carbon atoms may be mentioned. Preferably, the volatile hydrocarbon oil is selected from n-heptane, n-octane, n-nonane, n-undecane, n-dodecane, n-tridecane, n-tetradecane, and mixture thereof. In one particular embodiment, the volatile hydrocarbon oil is a mixture of n-undecane and n-tridecane, commercially available under the name of Cetiol® Ultimate from BASF.

As examples of the non-volatile hydrocarbon oils, non-volatile hydrocarbon oil of animal origin, hydrocarbon oil of plant origin, synthetic ether, synthetic ester, fatty alcohol, dialkyl carbonate, or mixture thereof may be mentioned. Preferably, the non-volatile hydrocarbon oil is selected from hydrocarbon oil of plant origin, dialkyl carbonate, and mixture thereof, and more preferably is a mixture of hydrocarbon oil of plant origin and dialkyl carbonate.

Suitable examples of hydrocarbon oils of plant origin are those such as phytostearyl esters, for instance phytostearyl oleate, phytostearyl isostearate and lauroyl/octyldodecyl/ phytostearyl glutamate (Ajinomoto, Eldew PS203) , triglycerides constituted of fatty acid esters and of glycerol, in particular in which the fatty acids may have chain lengths ranging from C4 to C36, and in particular from C18 to C36, it being possible for these oils to be linear or branched, and saturated or unsaturated; these oils may in particular be heptanoic

or octanoic triglycerides, shea oil, alfalfa oil, poppyseed oil, millet oil, barley oil, rye oil, candlenut oil, passionflower oil, aloe oil, sweet almond oil, peach kernel oil, groundnut oil, argan oil, avocado oil, baobab oil, borage oil, broccoli oil, calendula oil, camelina oil, canola oil, carrot oil, safflower oil, hemp oil, rapeseed oil, cottonseed oil, coconut oil, marrow seed oil, wheat germ oil, jojoba oil, lily oil, macadamia oil, maize oil, meadowfoam oil, St. John's wort oil, monoi oil, hazelnut oil, apricot kernel oil, nut oil, olive oil, evening primrose oil, palm oil, blackcurrant seed oil, kiwi seed oil, grapeseed oil, pistachio oil, pumpkin oil, winter squash oil, quinoa oil, musk rose oil, sesame oil, soya bean oil, sunflower oil, castor oil and watermelon oil, and mixtures thereof. Preferred is argan oil, such as that sold under the name of Lipofructyl Argan LS 9779 by BASF.

Suitable examples of synthetic ethers are those having from 10 to 40 carbon atoms, such as dicapryl ether.

Suitable examples of synthetic esters are for instance oils of formula R_1COOR_2, in which R_1 represents a linear or branched fatty acid residue containing from 1 to 40 carbon atoms and R_2 represents a hydrocarbon chain, in particular a branched chain, containing from 1 to 40 carbon atoms provided that R_1+R_2 is no less than 10. The esters may in particular be selected from fatty acid and alcohol esters, such as, for example, cetostearyl octanoate, isopropyl alcohol esters, such as isopropyl myristate or isopropyl palmitate, ethyl palmitate, 2-ethylhexyl palmitate, isopropyl stearate, octyl stearate, hydroxylated esters, for instance isostearyl lactate, octyl hydroxystearate, alcohol or polyalcohol ricinoleates, hexyl laurate, neopentanoic acid esters, for instance isodecyl neopentanoate, isotridecyl neopentanoate, isononanoic acid esters, for instance isononyl isononanoate, isotridecyl isononanoate.

Suitable examples of polyol esters and pentaerythritol esters are for instance dipentaerythrityl tetrahydroxy-stearate/tetraisostearate.

Suitable examples of fatty alcohols are those being liquid at ambient temperature, with a branched and/or unsaturated carbon chain containing from 12 to 26 carbon atoms, for instance 2-octyldodecanol, isostearyl alcohol, oleyl alcohol, C_{12}-C_{22} higher fatty acids, such as oleic acid, linoleic acid or linolenic acid, and mixtures thereof.

Suitable examples of dialkyl carbonates are those having two alkyl chains possibly being identical or different, such as dicaprylyl carbonate sold under the name Cetiol CC® by BASF.

According to the present invention, the water-insoluble emollient is present in an amount of 0.005 to 20% by weight, preferably 0.1 to 10% by weight based on the total weight of the hair conditioning composition.

Hair conditioning agent

The hair conditioning composition according to the present invention also contains a hair conditioning agent to achieve an excellent hair conditioning performance. The hair conditioning agent may be selected from hydrophobic silicone compounds, protein hydrolyzates, vitamins, amino acids, plant extracts and mixture thereof. Preferably, the hair conditioning composition is selected from hydrophobic silicone compounds, protein hydrolyzates and mixture thereof.

Suitable hydrophobic silicone compound are all silicone compounds with hair conditioning properties and which are insoluble in the aqueous phase. The hydrophobic silicone compounds may be highly volatile and of low molecular weight or low-volatile and of high molecular weight. Nonvolatile silicones in the sense of this application are silicones with no or only low vapor pressure at normal ambient conditions (1 atmosphere, 25°C). These silicones remain on the hair after they have been applied. Volatile silicones, on the other hand, vaporize after they have been applied to the hair, which under normal ambient condition typically occurs within a period of about 2 hours. The high-molecular-weight silicone, however, can also be a silicone polymer (silicone resin, silicone gum) dissolved in a low-molecular-weight liquid silicone. The viscosity of low-molecular-weight silicone oils is preferably from 100 to 1000 mPa s, and that of high-molecular-weight silicone oils from more than 1000 to 2,000,000 mPa s at 25° C. Suitable hydrophobic silicone compounds are, in general, cyclic polydimethylsiloxanes (INCI designation: cyclomethicones), for example octamethylcyclotetrasiloxane and decamethylcyclopentasiloxane, linear polydimethylsiloxanes (INCI designation: dimethicones), polydiethylsiloxanes, phenyl-substituted siloxanes (INCI designation: phenyltrimethicones), polymethylphenylsiloxanes, hydroxy-substituted siloxanes (INCI designation: dimethiconols), PEG/PPG-20/23 dimethicone, PEG/PPG-5/3 trisiloxane, PEG/PPG-23/6 dimethicone, PEG/PPG-18/18 dimethicone, PEG-12 dimethicone, PEG-8 dimethicone, or mixtures thereof. Preferred is PEG-12 dimethicone, such as that sold under the name of Xiameter® OFX-0193 Fluid from Dow Corning.

Suitable cationically modified protein derivatives or cationically modified protein hydrolyzates are those known, for example, under the INCI designations lauryldimonium hydroxypropyl hydrolyzed wheat protein, lauryldimonium hydroxypropyl hydrolyzed casein, lauryldimonium hydroxypropyl hydrolyzed collagen, lauryldimonium hydroxypropyl hydrolyzed keratin, lauryidimonium hydroxypropyl hydrolyzed silk, lauryidimonium hydroxypropyl hydrolyzed soy protein or hydroxypropyltrimonium hydrolyzed wheat, hydroxypropyltrimonium hydrolyzed casein, hydroxypropyltrimonium hydrolyzed collagen, hydroxypropyltrimonium hydrolyzed keratin, hydroxypropyltrimonium hydrolyzed rice bran protein, hydroxypropyltrimonium hydrolyzed silk, hydroxypropyltrimonium hydrolyzed soy protein and hydroxypropyltrimonium hydrolyzed vegetable protein.

Vitamins, provitamins and vitamin precursors, as well as derivatives thereof, that are suitable to be used in the invention are those representatives generally allocated to groups A, B, C, E, F and H.

Substances referred to as vitamin A include retinol (vitamin A1) and 3,4-didehydroretinol (vitamin A2). β-Carotene is the provitamin of retinol. Suitable vitamin A components include vitamin A acid and esters thereof, vitamin A aldehyde and vitamin A alcohol and esters thereof, such as palmitate and acetate.

The vitamin B group or vitamin B complex includes but not limited to Vitamin B1 (thiamin); Vitamin B2 (riboflavin); Vitamin B3, this name often including the compounds nicotinic acid and nicotinamide (niacinamide); Vitamin B5 (pantothenic acid and panthenol); Vitamin B6 (pyridoxine as well as pyridoxamine and pyridoxal).

Vitamin C is known as ascorbic acid used in the form of the palmitic ester, glucosides or phosphates.

Vitamin E is known as tocopherols, particularly α-tocopherol, and its derivatives, including in particular esters such as acetate, nicotinate, phosphate and succinate.

Vitamin F is known as essential fatty acids, in particular linoleic acid, linolenic acid and arachidonic acid.

Vitamin H is known as biotin having a structure of (3aS,4S,6aR)-2-oxohexahydrothienol[3,4-d]-imidazole-4-valeric acid.

Suitable protein hydrolyzates according to the present invention are product mixtures obtained by acid-, base- or enzyme-catalyzed degradation of proteins. The term “protein hydrolyzates” according to the invention includes total hydrolyzates and individual amino acids and derivatives thereof, as well as mixtures of various amino acids. Polymers built up from amino acids and amino acid derivatives are also included under the term “protein hydrolyzates”. The latter include, for example, polyalanine, polyasparagine, polyserine, etc. Other examples of useful compounds include L-alanyl-L-proline, polyglycine, glycyl-L-glutamine or D/L-methionine-S-methyl sulfonium chloride. It is also possible to use β-amino acids and derivatives thereof, such as β-alanine, anthranilic acid or hippuric acid. The molecular weight of protein hydrolyzates that can be used is from 75, the molecular weight of glycine, to 200,000. The molecular weight is preferably 75 to 50,000 and most particularly preferably 75 to 20,000 Daltons.

According to the invention, protein hydrolyzates of plant and animal, marine or synthetic origin can be used. Animal protein hydrolyzates include elastin, collagen, keratin, silk and milk protein hydrolyzates, which may also be present in the form of salts. These products are marketed, for example, under the trademarks Dehylan® (Cognis), Promois® (Interorgana), Collapuron® (Cognis), Nutrilan® (Cognis), Gelita-Sol® (Deutsche Gelatine Fabriken Stoess & Co), Lexein® (Inolex), Kerasol® (Croda) or ProSina® (Croda). Suitable protein hydrolyzates of vegetable origin include soy, almond, pea, potato, rice and wheat protein hydrolyzates. These products are obtainable, for example, under the trademarks Gluadin® (Cognis), DiaMin® (Diamalt), Lexein® (Inolex), Hydrosoy® (Croda), Hydrolupin® (Croda), Hydrosesame® (Croda), Hydrotritium® (Croda) and Crotein® (Croda).

Amino acids also have a skin-moisturizing action and, owing to their buffer effect, stabilize the acid mantle of the skin (i.e., they are used for (scalp) skin protection). Suitable amino acids include glycine, alanine, valine, leucine, isoleucine, phenylalanine, tyrosine, tryptophan, proline, aspartic acid, glutamic acid, asparagine, glutamine, serine, threonine, cysteine, methionine, lysine, arginine, histidine, β-alanine, 4-aminobutyric acid (GABA), betaine, L-cystine (L-cyss), L-carnitine, L-citrulline, L-theanine, 3’,4’-dihydroxy-L-phenylalanine (L-dopa), 5’-hydroxy-L-tryptophan, L-homocysteine, S-methyl-L-methionine, S-allyl-L-cysteine sulfoxide (L-alliin), L-trans-4-hydroxyproline, L-5-oxoproline (L-pyroglutamic acid), L-phosphoserine, creatine, 3-methyl-L-histidine, L-ornithine, with it being possible to use both individual amino acids and mixtures.

As examples of plant extracts for mechanical and sensory strengthening of the hair, the extracts of green tea, oak bark, echinacea, stinging nettle, witch hazel, hops, henna, chamomile, burdock root, horsetail, whitethorn, lime-tree blossom, almond, aloe vera, pine needles, horse chestnut, sandalwood, juniper, coconut, mango, apricot, lime, wheat, kiwi, melon, orange, grapefruit, sage, rosemary, birch, mallow, cuckoo flower, wild thyme, yarrow, thyme, melissa, rest harrow, coltsfoot, marshmallow, meristem, moringa, ginseng and ginger root in particular are preferred.

According to the present invention, the hair conditioning agent is present in an amount of 0.005 to 20% by weight, preferably 0.1 to 10% by weight based on the total weight of the hair conditioning composition.

Optionally, the hair conditioning composition in the present invention comprises additives selected from the group of surfactant, pH adjuster, stabilizer, preservative, fragrance, colorant, viscosity-adjusting material, UV absorber, and mixture thereof. The additives can be added into the thickened hydrophilic phase and/or the hydrophobic phase depending on the properties of the components and actual needs.

The hair conditioning composition in the present invention may further comprises a small amount of emulsifier commonly used in the art. Preferably, the emulsifier is present in the composition in an amount of less than 0.5%, or less than 0.1% by weight based on the total weight of the hair conditioning composition. More preferably, the hair conditioning composition contains no emulsifier.

In one particular embodiment, the hair conditioning composition comprises: a thickened hydrophilic phase, comprising 0.1 to 2% by weight of a thickening agent selected from the group consisting of Polyquaternium-37 and hydroxyethyl cellulose ether and 40 to 90% by weight of water; a hydrophobic phase having a melting point from 40°C to 65°C, and comprising 1 to 15% by weight of a solid wax selected from microcrystalline wax, beeswax, Carnauba wax, and mixture thereof, and 1 to 15% by weight of a water-insoluble emollient, and 0.1 to 10% by weight of a hair conditioning agent selected from hydrophobic silicone compound, protein hydrolysate, and mixture thereof, in which the hydrophobic phase is suspended in the thickened hydrophilic phase in the form of solid particles. The weight percentages are based on the total amount of the hair conditioning composition.

In another aspect, the present invention is directed to a process for preparing the hair

conditioning composition comprising, mixing a thickening agent with a liquid carrier to form a thickened hydrophilic phase, melting a solid wax and a water-insoluble emollient at a temperature from 70 to 100°C to form a hydrophobic phase, cooling down the mixture to 65°C to 70°C, adding the hydrophobic phase into the thickened hydrophilic phase to obtain a homogeneous dispersion with small solid particles while continuous cooling, adding the hair conditioning agent into the homogeneous dispersion at 40°C to 60°C, and further cooling down to room temperature whilst gently mixing to obtain a hair conditioning composition.

The solid particles of the hydrophobic phase in the hair conditioning composition are visible by naked human eye. Preferably, the solid particles of the hydrophobic phase has a particle size from 0.1 to 3 mm, preferably from 1 to 2 mm. Such solid particles of wax with larger size evenly suspended in the hair conditioner results in a more attractive product appearance to consumers. Surprisingly, the inventors has found that the hair conditioning composition according to the present invention achieves an “snow-melting” effect that the solid particle of wax can quickly melt when the composition is applied onto a palm and gently rubbed by palms, as if snows melt in palms. Preferably, the solid particles of the hydrophobic phase in 1 gram of the hair conditioning composition melt at a temperature of 58°C in 2 min.

The hair conditioning composition can be used in rinse-off or in leave-on hair conditioning treatment. A typical application as rinse-off product involves melting the hair conditioning composition containing solid particles and distributing an amount of hair conditioning composition sufficient to achieve a desired conditioning effect after washing the hair, into or onto wet or moist, towel-dried hair. The amount to be used depends on the fullness of the hair and typically ranges from 1 to 25 g and preferably from 3 to 10 g, and more preferably 4 to 8 g. After a sufficient exposure time of, for example, 1 to 15 minutes, the hair is rinsed. If only a gentle conditioning effect is desired, the rinsing may also be done immediately. The hair is then optionally combed or formed into a hair style and dried. For use as a leave-on product, 0.5 to 3 g of the product is preferably worked into the dry hair. As a result, the cuticulae are smoothed out, the undesirable entanglements are removed, and luster, stylability, control and structure are conferred to the hair.

The present invention may be better understood with reference to the following examples.

Examples

Materials

Polyquaternium-37 is commercially available under the trade name of Cosmedia® Ultragel 300 from BASF.

Hydroxyethyl cellulose is commercially available under the trade name of Natrosol 250 HR from Ashland.

Butyrospermum Parkii butter, a semi-solid emollient, is commercially available under the trade name of Cetiol SB 45 from BASF, and having a melting point of 42-46°C.

Mixture of paraffin and microcrystalline wax is commercially available under the trade name of Paracera W 80 from Paramelt, and having a melting point of 76-81°C.

Beeswax is commercially available under the trade name of Bienenwachs Weiss 8101 from Kahl, and having a melting point of 61-66°C.

Carnauba wax is commercially available under the trade name of Carnaubawachs prima gelb from Ter Hell & Co., and having a melting point of 80-86°C.

Dicaprylyl carbonate is commercially available under the trade name of Cetiol CC® from BASF.

Undecane/tridecane is a mixture of n-undecane and n-tridecane, commercially available under the name of Cetiol® Ultimate from BASF.

Argan oil is commercially available under the trade name of Lipofructyl Argan LS 9779 from BASF.

PEG-12 dimethicone is commercially available under the trade name of Xiameter® OFX-0193 Fluid from Dow Corning.

Hydrolyzed keratin is commercially available under the trade name of ProSina® from Croda.

Preparation of Examples

Hair conditioning compositions of inventive examples (Examples 1 to 5) and comparative examples (Examples 6 and 7) were prepared according to the formulation as shown in Table 1 in the following procedure: dispersing the thickeners of Group 1 into deionized water until homogeneous, premixing a solid wax and the water-insoluble emollient of Group 2 except dicaprylyl carbonate (if present) at 80°C and mixing until homogeneous, cooling down the mixture to 65°C and slowly adding the solid wax/oil mixture into Group 1 with gentle agitation and continuous cooling to obtain a homogeneous dispersion with small solid particles, and then adding dicaprylyl carbonate (if present) and a hair conditioning agent at 45°C and mixing until homogeneous, further cooling down the mixture to room temperature whilst gently mixing to obtain a hair conditioning composition.

Test methods

1. Melting point

The melting points of the solid waxes and the hydrophobic phase used in the examples were measured according to the method in the Chinese Pharmacopoeia, Version 2010 (Appendix VI B - "Method of measuring melting point").

2. Melting performance

1 gram of each hair conditioning composition were heated at 58°C in 2 min. "Good" indicated that the solid particles of the hydrophobic phase completely melt, and "Poor" indicated that the solid particles of the hydrophobic phase did not completely melt, and solid particles could be visibly found after heating 2 min.

3. Suspending stability

After preparation, each example was placed in a plastic bottle for 48 hours and was visually checked if the solid particles of the hydrophobic phase settled down to the bottom of bottle and/or coalesced in the bottle. "Good" indicated that the solid particles did not settle down or coalesce, and "Poor" indicated that the solid particles significantly settled down and/or coalesced.

4. Particle size of the solid particles

The particle size of the solid particles was determined by randomly selecting ten solid particles, measuring each particle size by a straight scale, and averaging the size value of the ten solid particles as the particle size. The testing results are shown in Table 1.

5. Hair conditioning performance

The conditioning performance of Example 1 and benchmark product Pentene EC SOS Nutri Elixir sold by Procter & Gamble was evaluated by the following steps:

1: Choose subjects having Asian hairs with normal or high level of damage to be subjected to the tests;

2: Wet the hair with warm water, and then apply 6 to 8 g shampoo (depending on the hair length of the subject) on the wet hair to lather and foam, and then rinse the hair copiously with warm water;

3: Apply 4 to 8 g hair conditioning composition to be tested (depending on the hair length of the subject) on palm, and gently rubbing the composition by palms until completely melting, then apply the melt composition on the shampooed hair from the middle of hair to the ends of hair, spread the hair conditioning composition on the hair evenly, and rinse the conditioned hair copiously with warm water;

4: Dry the wet hair with a towel; and

5: Dry the hair completely with a hairdryer.

A panel of 5 professional hairdressers evaluated the properties of the hair conditioning compositions, for example combility, softness, drying speed, finger touch feeling, appearance, smoothness of hair. The composition performance of Example 3 was sorted by level 0 to 6 as below, which was averaged by the total scores of the panel. The higher the number is close to 6, the better the performance is close to 1. If any performance of a composition is lower than 4, the composition is considered as not fulfilling the satisfaction of a person skilled in the art.

6: Very good,

5: Good,

4: Slightly good,

3: Slightly bad,

2: Bad, and

1: Very bad.

The testing and evaluation results of the evaluation were listed in Table 2.

Table 1. Formulations of examples (by weight parts) and test results

Composition			Example 1	Example 2	Example 3	Example 4	Example 5	Example 6	Example 7
Group 1	Thickener	Polyquaternium-37	0.7	0.7	0.7	0.7	0.7	0.7	0.7
		Hydroxyethyl cellulose	0.5	0.5	0.5	0.5	0.5	0.5	0.5
	Water	Deionized water	Up to 100	Up to 100	Up to 100	Up to 100	Up to 100	Up to 100	Up to 100
Group 2	Wax	Carnauba wax	-	-	-	-	1.5	-	-
		Mixture of paraffin and microcrystalline wax	1.5	1.5	1.5	-	-	5	-
		Beeswax	-	-	-	1.5	-	-	-
	Emollient	*Butyrospermum Parkii* butter	3	3	3	3	-	0.5	-
		Dicaprylyl carbonate	-	-	4	-		-	4
		Undecane/tridecane	4	1	-	4	4	-	-
		Argan oil	1	1	1	1	1	-	1
Group 3	Hair conditioning agent	PEG-12 dimethicone	4	4	4	4	4	4	4
		Hydrolyzed keratin	0.01	0.01	0.01	0.01	0.01	0.01	0.01
Test results	Melting point of hydrophobic phase		40 - 65°C	40 - 65°C	40 - 65°C	40 - 65°C	40- 65°C	>65°C	<40°C
	Melting performance		Good	Good	Good	Good	Good	Poor	Good
	Suspending stability		Good	Good	Good	Good	Good	Good	Poor
	Particle size of solids		≈2mm	≈2mm	≈2mm	≈2mm	≈2mm	≈2mm	N/A

Table 2: Results of hair conditioning evaluation

Testing item	**Example 1**	**Benchmark**
Combility after application on wet hair	4.6	4.6
Drying time	4.4	4.4
Finger through when drying	4.4	4.2
Combility when blow drying	4.4	4.2
Look of dry hair, not flying away	4.8	4.4
Shine	4.0	3.8
Softness of dry hair	4.4	4.2
Smoothness of dry hair	4.8	4.2
Moisture of dry hair ends	4.0	3.6
Heaviness of dry hair	4.0	4.0
Non overburdening	5.0	4.6
Static electricity control	4.0	4.0

As shown in Table 1, the hair conditioning compositions according to the present invention possessed an attractive appearance due to the visible solid particles having a particle size of about 2 millimeter and evenly suspended in gel matrix (as shown in Figure 1). Compared to Example 7 (comparative), the compositions in the inventive examples having a suitable melting point range of the hydrophobic phase were stably suspended in the gel matrix of the inventive compositions.

As evident in Table 1, the hair conditioning compositions according to the present invention exhibited an excellent melting effect at elevated temperature. When applied on human palm and gently rubbed with palms, the solid particles contained in the inventive gel compositions quickly melt so as to offer a “snow-melting” feeling to the consumer. The composition of Example 6 (comparative) contains a higher melting point range of the hydrophobic phase/solid particles, and thus could not easily melt when applied on human hands.

In addition, the inventive compositions exhibited comparable or even better conditioning performance, including combility, softness, drying speed, finger touch feeling, appearance,

smoothness of hair than the benchmark product as shown in Table 2.

These and other modifications and variations of the present invention may be practiced by those of ordinary skill in the art, without departing from the spirit and scope of the present invention. In addition, it should be understood that aspects of the various embodiments may be interchanged both in whole or in component. Furthermore, those of ordinary skill in the art will appreciate that the foregoing description is by way of example only, and is not intended to limit the invention so further described in such appended claims.

What is claimed is:

1. A hair conditioning composition, comprising
a thickened hydrophilic phase, comprising a thickening agent and liquid carrier,
a hydrophobic phase comprising a solid wax and a water-insoluble emollient, and having a melting point from 40°C to 65°C, and
a hair conditioning agent,
in which the hydrophobic phase is suspended in the thickened hydrophilic phase in the form of solid particles.

2. The hair conditioning composition according to claim 1, wherein the thickening agent is selected from cationic thickening polymer, non-ionic thickening polymer, anionic thickening polymer, amphoteric thickening polymer, and mixture thereof, and preferably is a mixture of cationic thickening polymer and non-ionic thickening polymer.

3. The hair conditioning composition according to claim 2, wherein the cationic thickening polymer is selected from cationic cellulose, cationic starch, cationic guar gum, a vinylic or (meth)acrylic polymer or copolymer having quaternary ammonium side chains, (meth)acrylate/aminoacrylate copolymer, amine substituted polyacrylate crosspolymers, a polymer or copolymer of a diallyl quaternary ammonium salt, and quaternized polyvinylpyrrolidone, and mixture thereof, preferably selected from (meth)acrylate copolymer or crosspolymer, a polymer or copolymer of a quaternary ammonium salt, and mixture thererof, and more preferably is Polyquaterniu-37.

4. The hair conditioning composition according to claim 2, wherein the non-ionic thickening polymer is selected from neutral guar gum, hydroxypropyl guar, cellulose ether and hydrophobically modified derivative thereof, starch, dextrin, and mixture thereof, and preferably is selected from neutral guar gum, cellulose ether, and mixture thereof, and more preferably is hydroxyethyl cellulose ether.

5. The hair conditioning composition according to claim 2, wherein the anionic thickening polymer is selected from anionic polysaccharide and derivative thereof, anionic gum, anionic cellulose derivative, and mixture thereof.

6. The hair conditioning composition according to claim 2, wherein the amphoteric thickening polymer is selected from carboxyl-modified cationic polysaccharide,

sulfonate-modified cationic polysaccharide, copolymers of cationic vinylic monomers with (meth)acrylic acid, copolymers of cationic (meth)acrylic monomers with (meth)acrylic acid, and mixture thereof.

7. The hair conditioning composition according to any one of claims 1 to 6, wherein the thickening agent is present in an amount of 0.01 to 5% by weight, preferably 0.1 to 2% by weight based on the total weight of the hair conditioning composition.

8. The hair conditioning composition according to any one of claims 1 to 7, wherein the liquid carrier is selected from water, alkanol having from 1 to 6 carbon atoms, carbitol, acetone, and mixtures thereof.

9. The hair conditioning composition according to any one of claims 1 to 8, wherein the liquid carrier is present in an amount of 0.01 to 95% by weight, preferably 40 to 90% by weight based on the total weight of the hair conditioning composition.

10. The hair conditioning composition according to any one of claims 1 to 9, wherein the solid wax is selected from natural wax, synthetic wax, silicone wax, triglyceride, and mixture thereof, and preferably selected from paraffin wax, microcrystalline wax, beeswax, carnauba solid wax, and mixture thereof.

11. The hair conditioning composition according to any one of claims 1 to 10, wherein the solid wax has a melting point of no less than 60°C, preferably from 60°C to 100°C.

12. The hair conditioning composition according to any one of claims 1 to 11, wherein the solid wax is present in an amount of 0.01 to 30% by weight, preferably 1 to 15% by weight based on the total weight of the hair conditioning composition.

13. The hair conditioning composition according to any one of claims 1 to 12, wherein the water-insoluble emollient is selected from liquid water-insoluble emollient, semi-solid water-insoluble emollient, and mixture thereof, and preferably selected from volatile hydrocarbon oil, non-volatile hydrocarbon oil, shea butter and the derivatives thereof, aliphatic acid ester of acid having 12 to 18 carbon atoms and alcohol having 12 to 18 carbon atoms, and mixture thereof.

14. The hair conditioning composition according to claim 13, wherein the semi-solid

water-insoluble emollient has a melting point of 30°C to 60°C, preferably from 40°C to 55°C.

15. The hair conditioning composition according to claim 13, wherein the volatile hydrocarbon oil is a volatile linear alkane oil having from 7 to 16 carbon atoms, preferably selected from n-heptane, n-octane, n-nonane, n-undecane, n-dodecane, n-tridecane, n-tetradecane, and mixture thereof, more preferably is the mixture of n-undecane and n-tridecane.

16. The hair conditioning composition according to claim 13, wherein the non-volatile hydrocarbon oil is selected from non-volatile hydrocarbon oil of animal origin, hydrocarbon oil of plant origin, synthetic ether, synthetic ester, fatty alcohol, dialkyl carbonate, and mixture thereof, preferably is a mixture of hydrocarbon oil of plant origin and dialkyl carbonate.

17. The hair conditioning composition according to any one of claims 1 to 16, wherein the water-insoluble emollient is present in an amount of 0.005 to 20% by weight, preferably 0.1 to 10% by weight based on the total weight of the hair conditioning composition.

18. The hair conditioning composition according to any one of claims 1 to 17, wherein the hair conditioning agent is selected from hydrophobic silicone compound, protein hydrolyzates, vitamins, amino acids, plant extracts and mixture thereof.

19. The hair conditioning composition according to any one of claims 1 to 18, wherein the hair conditioning agent is present in an amount of 0.005 to 20% by weight, preferably 0.1 to 10% by weight based on the total weight of the hair conditioning composition.

20. The hair conditioning composition according to any one of claims 1 to 19, wherein the hydrophobic phase has a melting point from 45°C to 60°C.

21. The hair conditioning composition according to any one of claims 1 to 20, optionally comprising additives selected from the group of surfactant, pH adjuster, stabilizer, preservative, fragrance, colorant, viscosity-adjusting material, UV absorber, and mixture thereof.

22. The hair conditioning composition according to any one of claims 1 to 21, wherein the

solid particles of the hydrophobic phase has a particle size from 0.1 to 3 mm, preferably from 1 to 2 mm.

23. The hair conditioning composition according to any one of claims 1 to 22, in which the solid particles of the hydrophobic phase in 1 gram of the hair conditioning composition melt at a temperature of 58°C in 2 min.

24. The hair conditioning composition according to any one of claims 1 to 23, wherein the thickened hydrophilic phase has a Brookfield viscosity from 10,000 to 20,000 cPs at room temperature.

25. The hair conditioning composition according to any one of claims 1 to 24, wherein the thickened hydrophilic phase has a pH from 3 to 7, preferably from 4 to 5.

26. The hair conditioning composition according to claim 1, comprising,
a thickened hydrophilic phase, comprising 0.1 to 2% by weight of a thickening agent selected from the group consisting of Polyquaternium-37 and hydroxyethyl cellulose ether and 40 to 90% by weight of water,
a hydrophobic phase having a melting point from 40°C to 65°C, and comprising 1 to 15% by weight of a solid wax selected from microcrystalline wax, bee wax, Carnauba solid wax, and mixture thereof, and 1 to 15% by weight of a water-insoluble emollient, and
0.1 to 10% by weight of a hair conditioning agent selected from hydrophobic silicone compound, protein hydrolysate, and mixture thereof,
in which the hydrophobic phase is suspended in the thickened hydrophilic phase in the form of solid particles, and the weight percentages are based on the total amount of the hair conditioning composition.

27. A process for preparing the hair conditioning composition according to any one of claims 1 to 26, comprising:
mixing a thickening agent with a liquid carrier to form a thickened hydrophilic phase,
melting a solid wax and a water-insoluble emollient at a temperature from 70 to 100°C to form a hydrophobic phase, cooling down the mixture to 65°C to 70°C, adding the hydrophobic phase into the thickened hydrophilic phase to obtain a homogeneous dispersion with small solid particles while continuous cooling, and
adding the hair conditioning agent into the homogeneous dispersion at 40°C to 60°C,

and further cooling down to room temperature whilst gently mixing to obtain a hair conditioning composition.

28. Use of the hair conditioning composition according to any one of claims 1 to 26 in rinse-off or in leave-on hair conditioning treatment.

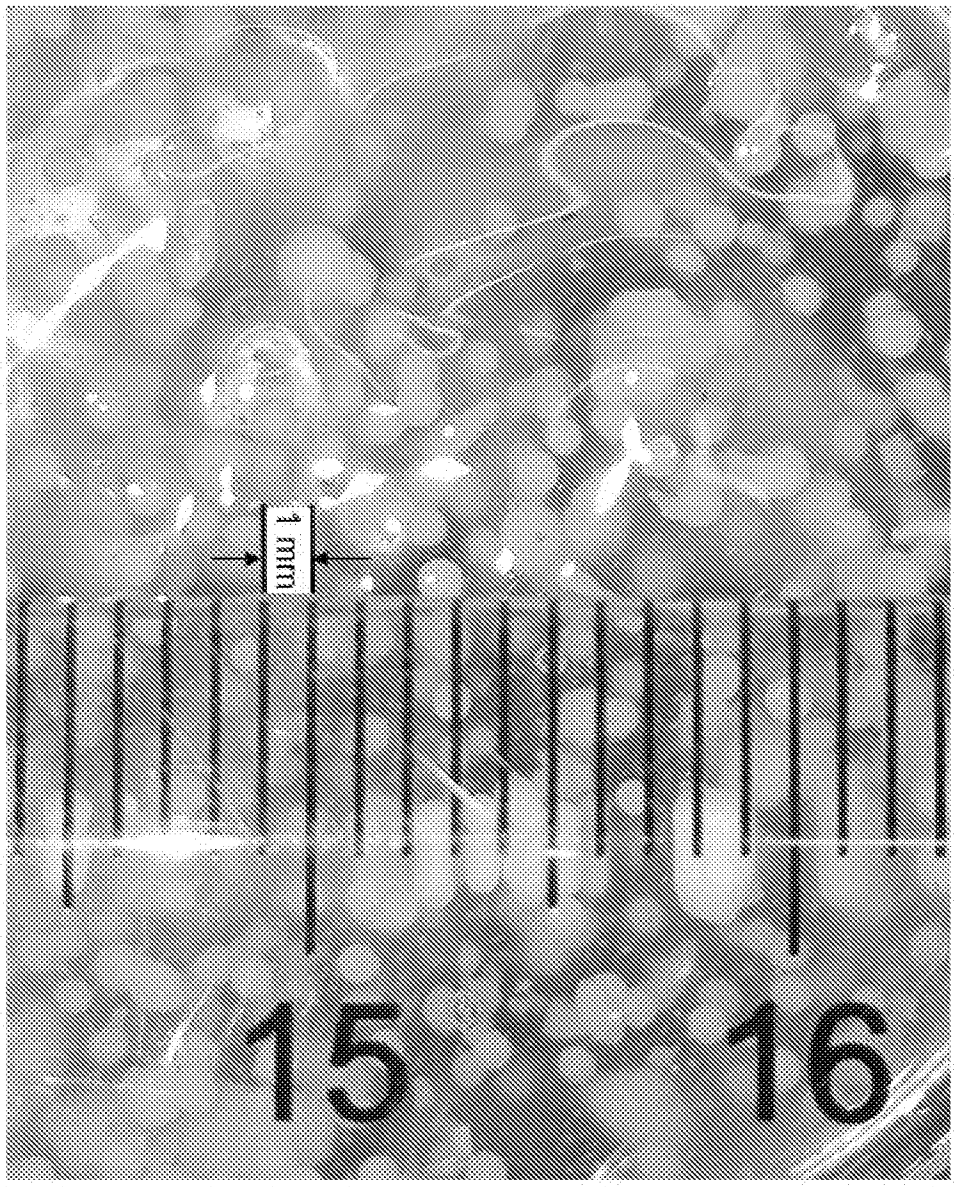


Figure 1

INTERNATIONAL SEARCH REPORT

International application No.
PCT/CN2017/093504

A. CLASSIFICATION OF SUBJECT MATTER

A61Q 5/12(2006.01)i; A61K 8/92(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)

A61Q 5/-,A61K 8/-

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)

CNPAT,DWPI,SIPOABS,ISI: hair,conditioning,thickened,thickening,wax,emollient,melting,solid,particle,hydrophobic, hydrophilic

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	US 2003053974 A1 (SHEFER, ADI ET AL.) 20 March 2003 (2003-03-20) description, paragraphs [0042]-[0170]	1-28
A	US 2002146379 A1 (SHEFER, ADI ET AL.) 10 October 2002 (2002-10-10) the whole document	1-28
A	US 2014093468 A1 (HENKEL AG. & CO. KGAA.) 03 April 2014 (2014-04-03) the whole document	1-28
A	US 2008286367 A1 (AMCOL INTERNATIONAL CORP.) 20 November 2008 (2008-11-20) the whole document	1-28
A	US 2014023605 A1 (HENKEL AG. & CO. KGAA.) 23 January 2014 (2014-01-23) the whole document	1-28

☐ 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	Date of mailing of the international search report
09 March 2018	**27 March 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 **ZHENG,Kai** Telephone No. **(86-10)53962195**

INTERNATIONAL SEARCH REPORT
Information on patent family members

International application No.
PCT/CN2017/093504

Patent document cited in search report	Publication date (day/month/year)	Patent family member(s)	Publication date (day/month/year)
US 2003053974 A1	20 March 2003	AU 2003256555 A1	03 March 2004
		US 6979440 B2	27 December 2005
		EP 1396260 A1	10 March 2004
		JP 2006510580 A	30 March 2006
		WO 2004016232 A1	26 February 2004
US 2002146379 A1	10 October 2002	EP 1365731 A4	21 March 2007
		JP 2004517935 A	17 June 2004
		DE 60224365 D1	14 February 2008
		US 6491902 B2	10 December 2002
		EP 1365731 B1	02 January 2008
		AT 382325 T	15 January 2008
		CA 2435313 A1	08 August 2002
		WO 02060399 A1	08 August 2002
		DE 60224365 T2	22 January 2009
		EP 1365731 A1	03 December 2003
		JP 4112980 B2	02 July 2008
US 2014093468 A1	03 April 2014	EP 2717843 B1	12 October 2016
		CN 103607995 A	26 February 2014
		DE 102011077365 A1	13 December 2012
		WO 2012168309 A3	30 May 2013
		WO 2012168309 A2	13 December 2012
		JP 2014516068 A	07 July 2014
		EP 2717843 A2	16 April 2014
US 2008286367 A1	20 November 2008	EP 2164448 A1	24 March 2010
		WO 2008143862 A4	19 February 2009
		CA 2691036 A1	27 November 2008
		EP 2164448 A4	04 July 2012
		WO 2008143862 A1	27 November 2008
		US 7888306 B2	15 February 2011
US 2014023605 A1	23 January 2014	WO 2012130656 A2	04 October 2012
		JP 2014508789 A	10 April 2014
		DE 102011015191 A1	27 September 2012
		WO 2012130656 A3	02 May 2013
		CN 103442683 A	11 December 2013
		EP 2688547 A2	29 January 2014