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

(19) World Intellectual Property Organization
International Bureau

(43) International Publication Date
01 July 2021 (01.07.2021)

WIPO | PCT

(10) International Publication Number
WO 2021/128045 A1

(51) International Patent Classification:
A61K 8/49 (2006.01) *A61Q 17/04* (2006.01)
A61K 8/37 (2006.01) *A61Q 5/00* (2006.01)
A61K 8/92 (2006.01)

(21) International Application Number:
PCT/CN2019/128199

(22) International Filing Date:
25 December 2019 (25.12.2019)

(25) Filing Language: English

(26) Publication Language: English

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(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))*

WO 2021/128045 A1

(54) Title: COMPOSITION FOR CONDITIONING KERATAIN FIBERS

(57) **Abstract:** It relates to a composition for conditioning keratin fibres, comprising: a) at least one lipophilic dye; b) at least one lipophilic UV filter; c) at least one lipophilic phenolic antioxidant; and d) at least one oil. It also relates to a cosmetic process for caring for keratin fibres comprising at least a step of applying onto said keratin fibres.

COMPOSITION FOR CONDITIONING KERATAIN FIBERS

TECHNIAL FIELD

The present invention relates to a composition for conditioning keratin fibres, in particular human keratin fibres such as the hair. The present invention also relates to a cosmetic process for conditioning keratin fibres.

BACKGROUND ART

The hair is generally damaged and weakened by the action of external atmospheric agents such as light, weather, and/or the action of mechanical or chemical treatments such as brushing, combing, dyeing, bleaching, permanent and / or straightening.

There are many products available for altering the natural color of hair. The process of altering the color of hair can involve either depositing an artificial color onto the hair, which provides a different shade or color to the hair, or lifting the color of the hair, for example, from a dark brown shade to a medium brown or a light brown shade. Hair color can be changed using permanent, semi-permanent, or temporary hair-coloring products.

Many consumers desire a permanent color change and therefore use products containing permanent dyes. Conventional permanent hair coloring products are dye compositions comprising oxidation dye precursors, which are also known as primary intermediates or couplers. These oxidation dye precursors are colorless or weakly colored compounds which, when combined with oxidizing products, give rise to colored complexes by a process of oxidative condensation. The oxidizing products conventionally use peroxides such as hydrogen peroxide as oxidizing agents. Such permanent hair color products also contain ammonia or other alkalizing agents such as monoethanolamine (MEA) which causes the hair shaft to swell, thus allowing the small oxidative dye molecules to penetrate the cuticle and cortex before the oxidation condensation process is completed. The resulting larger-sized colored complexes from the oxidative reaction are then trapped inside the hair fiber, thereby permanently altering the color of the hair. Newly, permanently colored hair usually has a vibrant, shiny, and rich appearance.

However, in just a few short weeks, or in some cases even less, the color begins to fade due to washing or exposure to environmental conditions. For instance, gorgeous rich brown colors become muddy and dull, beautiful shades of blonde turn brassy, and vibrant reds do not look so vibrant anymore, resulting in golden, orange or brownish tonalities not desirable to the consumer, especially in fragile areas, and more particularly at the ends leading to split ends.

Efforts have been made to formulate composition for conditioning the hair, wherein the composition comprises dyes for providing color retouch effect.

However, hair care compositions containing dyes have a problem in that they tend to become unstable due to light and/or elevated temperature.

There is therefore a need to develop compositions which can provide a color retouch effect and are stable under light and/or elevated temperature for an expected period of time.

SUMMARY OF THE INVENTION

An object of the present invention is thus to develop a composition which can provide a color retouch effect on keratin fibres, in particular human keratin fibres such as the hair, and are stable under light and/or elevated temperature for an expected period of time.

Thus, according to a first aspect, the present invention provides a composition for conditioning keratin fibres, comprising:

a) at least one lipophilic dye;

b) at least one lipophilic UV filter;

c) at least one lipophilic phenolic antioxidant; and

d) at least one oil.

According to a second aspect, the present invention provides a cosmetic process for conditioning keratin fibers comprising applying the composition as described above to the keratin fibers.

The inventors have found that with the combination of a) at least one lipophilic dye, b) at least one lipophilic UV filter, and c) at least one lipophilic antioxidant, the composition can provide a color retouch effect on keratin fibres and is stable under light and/or elevated temperature of 50 °C for at least 24 hours.

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

DETAILD DESCRIPTION OF THE INVENTION

As used herein, unless otherwise indicated, the limits of a range of values are included within this range, in particular in the expressions "between…and…" and "from… to …".

As used herein, the term “comprising” is to be interpreted as encompassing all specifically mentioned features as well optional, additional, unspecified ones.

As used herein, the use of the term “comprising” also discloses the embodiment wherein no features other than the specifically mentioned features are present (*i.e.* “consisting of”).

Unless otherwise defined, all technical and scientific terms used herein have the same meaning as commonly understood by those skilled in the field the present invention belongs to. When the definition of a term in the present description conflicts with the meaning as commonly understood by those skilled in the field the present invention belongs to, the definition described herein shall apply.

Unless otherwise specified, all numerical values expressing amount of ingredients and the like used in the description and claims are to be understood as being modified by the term “about”. Accordingly, unless indicated to the contrary, the numerical values and parameters described herein are approximate values which are capable of being changed according to the desired performance obtained as required.

As used herein, the expression "at least one" used in the present description is equivalent to the expression "one or more" and may be substituted for it.

As used therein, the term “keratin fibers” includes animal keratin fibers and human keratin fibers such as the hair.

By “provide a color retouch effect”, it means that the composition can be used to resist the dullness and yellowish, especially on the tips of the hair, to render the color of the hair to be shiny and even.

According to the first aspect of the present invention, a composition for conditioning keratin fibres comprises:

a) at least one lipophilic dye;
b) at least one lipophilic UV filter;
c) at least one lipophilic phenolic antioxidant; and
d) at least one oil.

Lipophilic dyes

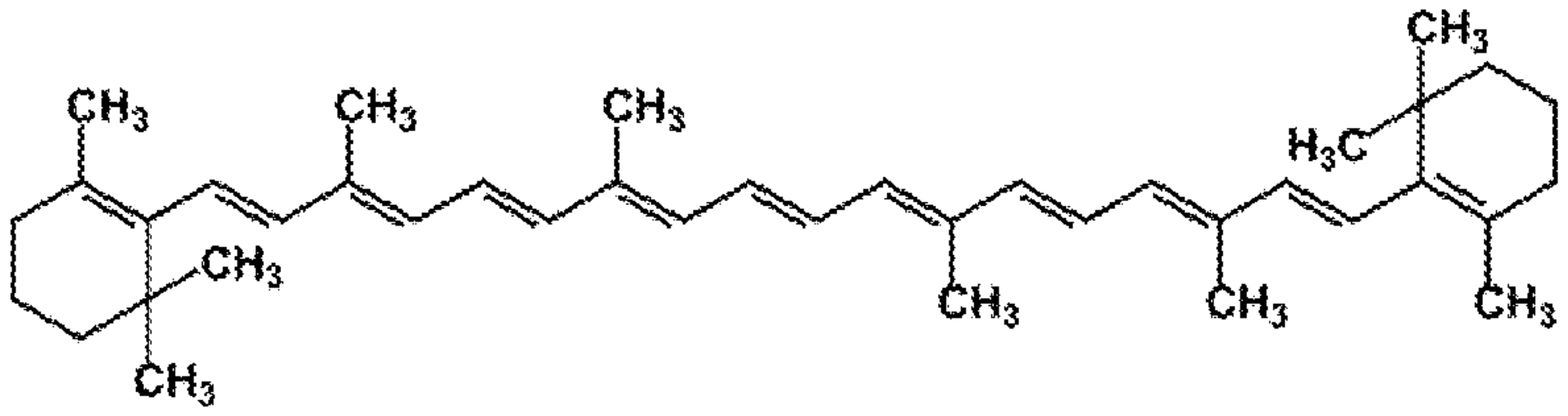
According to the first aspect of the present invention, the composition comprises at least one lipophilic dye.

Preferably, the lipophilic dye is selected from natural or synthetic lipophilic dyes.

According to a preferred embodiment, the lipophilic dye is selected from DC Red 17, DC Red 21, DC Red 27, DC Green 6, DC Yellow 11, DC Violet 2, DC Orange 5, Sudan Red, Sudan brown, quinoline yellow, annatto, curcumin, carotenes, xanthophylls, lipophilic green dyes and a mixture thereof.

Among the carotenes, mention can be made to, in particular, α-carotene, β-carotene, lycopene.

Among the carotenes, β-carotene will be used more particularly (CI 40800, CI 75130, Food Orange 5 or Natural Yellow 26). The β-carotene molecule is a chain consisting of 8 isoprenic units with alternating single and double bonds, and has the following formula:



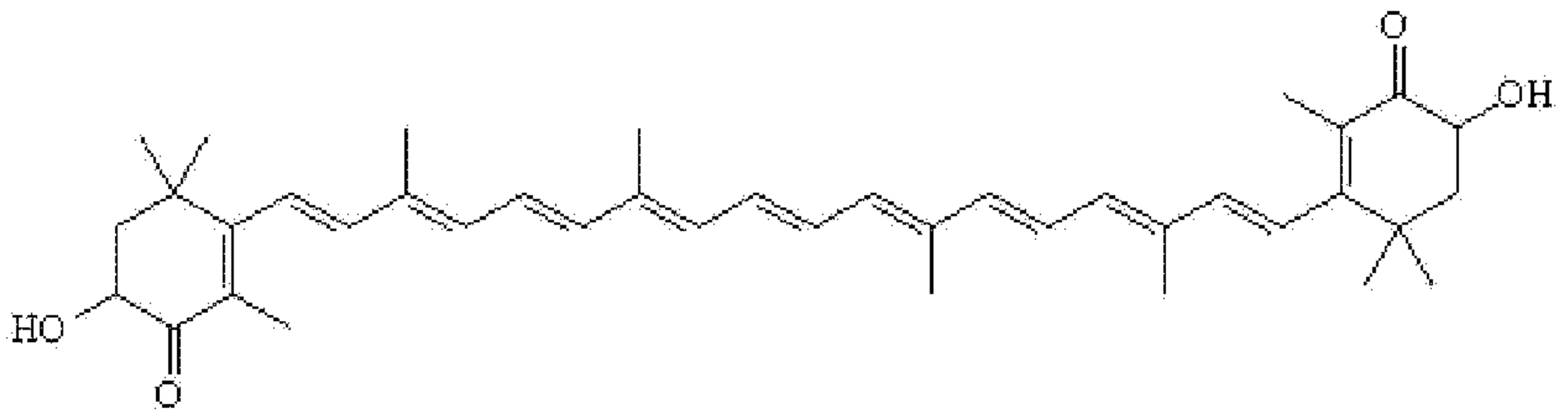
β-carotene is found in some fruits and vegetables: pepper, carrot, spinach, lettuce, tomato, sweet potato, broccoli, cantaloupe, squash, apricot. β-carotene can be obtained either by extraction, by synthesis or by biotechnological means. Natural β-carotene comes mainly from red palm oil and alfalfa and also from carrot oil.

According to a particularly preferred form, β-carotene will be used in the form of a dispersion in an oil such as a 30% dispersion of β-carotene in sunflower oil, such as the product sold under the trade name 409185 CAROTENE-DISPERSION NATURAL 30% L-OS E-160A manufactured by LCW - Sensient Cosmetic Technologies or the 30% dispersion in corn oil, such as the product sold under the trade name 30% Beta Carotene FS (Fluid Suspension) by the company DSM Nutritional Products, Inc.

Among the xanthophylls, mention can be made to, in particular:

astaxanthin
antheraxanthin
citranaxanthine
cryptoxanthin
canthaxanthin
diatomoxanthine
flavoxanthine
fucoxanthin
lutein
rhodoxanthin
rubixanthine
siphonaxanthine
violaxanthine
zeaxanthin.

Among the xanthophylls, there will be used more particularly the astaxanthin of formula:



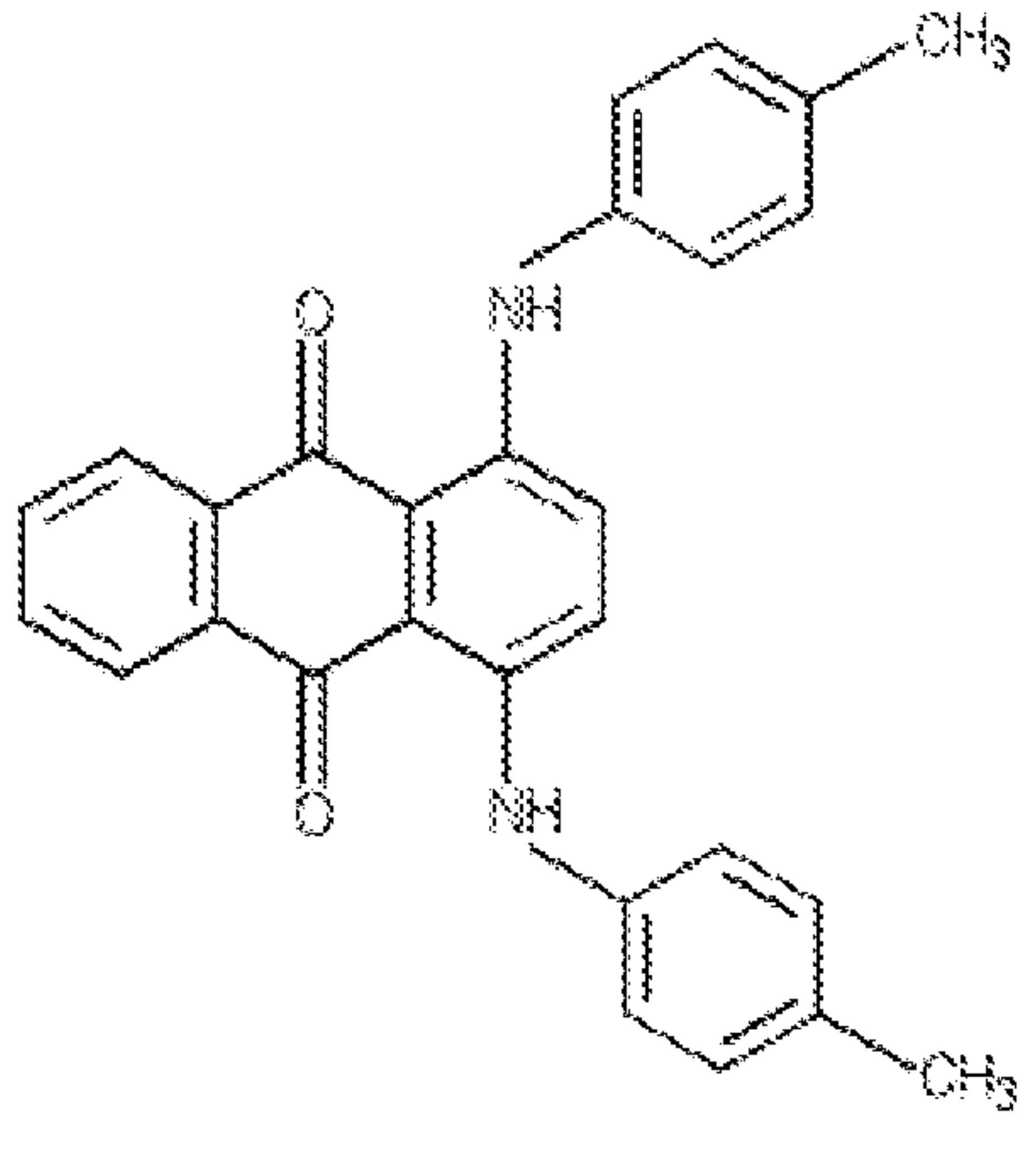
Astaxanthin is usually extracted from the alga Haematococcus pluvialis. It belongs to the family of terpenes, and is part of the phytochemicals. It is present in crustaceans (crabs, shrimps, lobster, crayfish, lobsters), salmon, sea bream and in the feathers of some birds. It can be considered as the ultimate term of a series of hydroxylations and oxidations from β-carotene.

According to a particularly preferred form, the astaxanthin will be used in the form of a dispersion in an oil such as a 5% dispersion of astaxanthin from Euphausia Superba in a caprylic/capric triglyceride mixture such as the product sold under the name Commercial ASTAX-S by the company ITANO REFRIGERATED FOOD, or a dispersion of 4.5-7% asthaxanthin in a caprylic/capric triglyceride mixture extracted from seaweed HAEMATOCOCCUS PLUVIALIS as the product sold under the trade name ASTA TROL-X by FUJI COLOR, or the product sold under the trade name BIOASTIN 5% OLEORESIN by the company CYANOTECH.

It is also possible to mention asthaxanthin dispersions in a caprylic/capric triglyceride mixture extracted from HAEMATOCOCCUS PLUVIALIS algae, such as AM Asta-SOD commercial products from Athena Co LTD; the Astaxanthin-5C and Astaxanthin-PC1 commercial products by Oryza Oil & Fat Chemical Co.

By "green dye" is meant any organic cosmetic or dermatological dye capable of absorbing light radiation of wavelength between 400 and 500 nm and those of wavelength between 600 and 700 nm.

Among the lipophilic green dyes that may be used according to the invention, mention may be made of quinizarin (Ceres Green BB, D&C Green No. 6, CI 61565, 1,4-Di-p-toluidoanthraquinone, Green No. 202, Quinizarin Green SS) of formula:



such as the product sold under the trade name D&C Green 6 K7016 by LCW - Sensient Cosmetic Technologies.

Among the lipophilic green dyes, chlorophylls may also be mentioned more preferably. Chlorophylls consist of four ring-shaped pyrrole rings as a complex of a divalent cation and a long-chain alcohol such as phytol. There are several forms of chlorophyll differentiable according to their chemical structure. Chlorophyll exists in all plants, chlorophyll b is found in higher plants and green algae. Two other variants exist in brown algae and some cyanobacteria, respectively chlorophylls c and d. The divalent cation (s) present in chlorophylls are generally selected from alkali metals such as sodium or potassium, alkaline earth metals such as calcium, magnesium and transition metals such as copper and iron or mixtures thereof.

It is preferable to use a chlorophyll in the form of a copper complex and more particularly in the form of a dispersion in an oil such as sunflower oil or grape seed oil, such as the commercial products CHLOROPHYLLE LIPOSOLUBLE W 7208, 503509 COPPER CHLOROPHYLL 15% L -OS and CHLOROPHYLLE LIPOSOLUBLE W 7208 sold by LCW - Sensient Cosmetic Technologies.

According to a particularly preferred embodiment, the composition according to the invention comprises lipophilic dye(s) selected from D&C Violet 2 (C.I. 60725), beta-carotene (C.I. 75130), Green 6 (C.I. 61565), astaxanthin, and mixtures thereof.

Advantageously, the lipophilic dye is present in amount ranging from 0.001 wt.% to 1 wt.%, preferably from 0.002 wt.% to 0.5 wt.%, more preferably from 0.002 wt.% to 0.1 wt.%, relative to the total weight of the composition.

According to a particular embodiment, the composition according to the invention comprises a mixture of beta-carotene (C.I. 75130) and D&C Violet 2 (C.I. 60725); preferably in a total content representing from 0.001 wt.% to 0.1 wt.%, relative to the total weight of the composition.

According to another particular embodiment, the composition according to the invention comprises a mixture of astaxanthin and D&C Violet 2 (C.I. 60725); preferably in a total content representing from 0.001 wt.% to 0.1 wt.%, relative to the total weight of the composition.

According to another particular embodiment, the composition according to the invention comprises a mixture of Green 6 (C.I. 61565), astaxanthin and D&C Violet 2 (C.I. 60725); preferably in a total content representing from 0.001 wt.% to 0.1 wt.%, relative to the total weight of the composition.

Lipophilic UV Filter

According to the first aspect of the present invention, the composition comprises at least one lipophilic UV filter.

The term “lipophilic UV filter” means an organic molecule that is capable of screening out UV radiation between 290 and 400 nm, and which can be dissolved in a molecular form or dispersed in a fatty phase in order to obtain a macroscopically homogeneous phase. The term “organic molecule” means any molecule comprising in its structure one or more carbon atoms. Thus, the lipophilic UV filter used for the present invention may be active in the UV-A and/or UV-B region.

The lipophilic UV filter may be solid or liquid. The terms “solid” and “liquid” mean solid and liquid, respectively, at 25°C under 1 atm.

The lipophilic UV filter may be selected especially from cinnamic derivatives; anthranilates; salicylic derivatives; dibenzoylmethane derivatives, camphor derivatives; benzophenone derivatives; β, β-diphenylacrylate derivatives; benzotriazole derivatives; benzalmalonate derivatives, especially those mentioned in patent US 5 624 663; imidazolines; p-aminobenzoic acid (PABA) derivatives; benzoxazole derivatives as described in patent applications EP 0 832 642, EP 1 027 883, EP 1 300 137, and DE 101 62 844; screening polymers and screening silicones such as those described especially in patent application WO 93/04665; α-alkylstyrene-based dimers, such as those described in patent application DE 198 55 649; 4,4-diarylbutadienes such as those described in patent applications EP 0 967 200, DE 197 46 654, DE 197 55 649, EP-A-1 008 586, EP 1 133 980, and EP 133 981; merocyanin derivatives such as those described in patent applications WO 04/006 878, WO 05/058 269, WO 06/032 741, FR 2 957 249, and FR 2 957 250; and a mixture thereof.

As examples of the lipophilic UV filter, mention may be made of those denoted hereinbelow under their INCI names:

Dibenzoylmethane derivative:

Butylmethoxydibenzoylmethane or avobenzone sold under the trade name Parsol 1789 by the company DSM Nutritional Products,

Para-aminobenzoic acid derivatives:

Ethyl PABA,

Ethyl Dihydroxypropyl PABA,

Ethylhexyl Dimethyl PABA sold in particular under the name Escalol 507 by ISP,

Salicylic derivatives:

Homosalate sold under the name Eusolex HMS by Rona/EM Industries, Ethylhexyl salicylate sold under the name Neo Heliopan OS by Symrise,

Cinnamic derivatives:

Ethylhexyl methoxycinnamate sold especially under the trade name Parsol MCX by DSM Nutritional Products,

Isopropyl methoxycinnamate,

Isoamyl methoxycinnamate sold under the trade name Neo Heliopan E 1000 by Symrise,

Cinoxate,

Diisopropyl methylcinnamate,

β,β-Diphenylacrylate derivatives:

Octocrylene sold especially under the trade name Uvinul N539 by BASF,

Etocrylene sold in particular under the trade name Uvinul N35 by BASF,

Benzophenone derivatives:

Benzophenone-1 sold under the trade name Uvinul 400 by BASF,

Benzophenone-2 sold under the trade name Uvinul D50 by BASF,

Benzophenone-3 or oxybenzone sold under the trade name Uvinul M40 by BASF,

Benzophenone-6 sold under the trade name Helisorb 11 by Norquay,

Benzophenone-8 sold under the trade name Spectra-Sorb UV-24 by American Cyanamid,

Benzophenone-12,

N-hexyl 2-(4-diethylamino-2-hydroxybenzoyl)benzoate sold under the trade name Uvinul A+ or in the form of a mixture with octyl methoxycinnamate under the trade name Uvinul A+B by BASF,

Benzylidenecamphor derivatives:

3-Benzylidene Camphor manufactured under the name Mexoryl SD by Chimex,

4-Methylbenzylidene Camphor sold under the name Eusolex 6300 by Merck,

Polyacrylamidomethylbenzylidenecamphor manufactured under the name Mexoryl SW by Chimex,

Phenylbenzotriazole derivatives:

Drometrizole trisiloxane sold under the name Silatrizole by Rhodia Chimie,

Bumetrizole, sold under the name Tinoguard AS by Ciba-Geigy.

Anthranilic derivatives:
Menthyl Anthranilate sold under the trade name Neo Heliopan MA by Symrise,

Imidazoline derivatives:
Ethylhexyl dimethoxybenzylidene dioxoimidazoline propionate,

Benzalmalonate derivatives:
Dineopentyl 4'-methoxybenzalmalonate,
Polyorganosiloxane containing benzalmalonate functions, for instance Polysilicone-15, sold under the trade name Parsol SLX by DSM,

4,4-Diarylbutadiene derivatives:
1,1-dicarboxy(2,2'-dimethylpropyl)-4,4-diphenylbutadiene,

Lipophilic merocyanin derivatives:
Octyl 5-N,N-diethylamino-2-phenylsulfonyl-2,4-pentadienoate
and mixtures thereof.

Preferable lipophilic UV filters may be selected from:
Butylmethoxydibenzoylmethane,
Ethylhexyl methoxycinnamate,
Ethylhexyl salicylate,
Homosalate,
Butylmethoxydibenzoylmethane,
Octocrylene,
Benzophenone-3,
n-Hexyl 2-(4-diethylamino-2-hydroxybenzoyl)benzoate,
4-Methylbenzylidenecamphor,
Ethylhexyl triazone,
Diethylhexyl Butamido Triazone,
Drometrizole Trisiloxane,
Bumetrizole,
Polysilicone-15,
1,1-dicarboxy(2,2'-dimethylpropyl)-4,4-diphenylbutadiene, and
mixtures thereof.

More preferable lipophilic UV filters may be selected from:
Butylmethoxydibenzoylmethane,

Ethylhexyl methoxycinnamate,
Octocrylene,
Ethylhexyl salicylate,
n-Hexyl 2-(4-diethylamino-2-hydroxybenzoyl)benzoate,
Ethylhexyl triazone,
Diethylhexyl Butamido Triazone,
Drometrizole trisiloxane,
Bumetrizole, and
mixtures thereof.

In a preferred embodiment, the composition according to the present invention comprises bumetrizole and/or drometrizole trisiloxane as lipophilic UV filter.

Advantageously, the lipophilic UV filter is present in amount ranging from 0.01 wt.% to 1 wt.%, preferably from 0.02 wt.% to 0.6 wt.%, more preferably from 0.03 wt.% to 0.3 wt.%, relative to the total weight of the composition.

Lipophilic phenolic antioxidant

According to the first aspect of the present invention, the composition comprises at least one lipophilic phenolic antioxidant.

The lipophilic phenolic antioxidant means that the partition coefficient of the phenolic antioxidant between n-butanol and water is >1, more preferably >10 and even more preferably >100.

As phenolic antioxidants, mention may be made of, those which have a hindered phenol structure or a semi-hindered phenol structure within the molecule. As specific examples of such compounds, mention may be made of, 3,5-bis(1,1-dimethylethyl)-4-hydroxybenzenepropanoic acid) which has INCI name of pentaerythrityl tetra-di-t-butyl hydroxyhydrocinnamate, 2,6-di-tert-butyl-4-methylphenol, 2,6-di-tert-butyl-4-ethylphenol, mono- or di- or tri-(α-methylbenzyl)phenol, 2,2'-methylenebis(4-ethyl-6-tert-butylphenol), 2,2'-methylenebis(4-methyl-6-tert-butylphenol), 4,4'-butylidenebis(3-methyl-6-tert-butylphenol), 4,4'-thiobis(3-methyl-6-tert-butylphenol), 2,5-di-tert-butylhydroquinone, 2,5-di-tert-amylhydroquinone, tris[N-(3,5-di-tert-butyl-4-hydroxybenzyl)]isocyanurate, 1,1,3-tris(2-methyl-4-hydroxy-5-tert-butylphenyl)butane, butylidene-1,1bis[3-(3-tert-butyl-4-hydroxy-5-methylphenyl)propionate], octadecyl 3-(3,5-di-tert-butyl-4-hydroxyphenyl)propionate, tetrakis[methylene-3-(3,5-di-tert-butyl-4-hydroxyphenyl)propionato]methane, triethylene glycol bis[3-(3-tert-butyl-4-hydroxy-5-methylphenyl)propionate], 3,9-bis{2-[3-(3-tert-butyl-4-hydroxy-5-methylphenyl)propionyloxy]-1,1-dimethylethyl}-2,4,8,10-tetraoxaspiro [5.5]undecane, 1,3,5-trimethyl-2,4,6-tris(3,5-di-tert-butyl-4-hydroxybenzyl)benzene, 2,2-thiodiethylenebis[3-(3,5-di-tert-butyl-4-

hydroxyphenyl)propionate], N,N’-hexamethylenebis(3,5-di-tert-butyl-4-hydroxyhydrocinnamide), 1,6-hexanediol bis[3-(3,5-di-tert-butyl-4-hydroxyphenyl)propionate], 1,3,5-tris[(4-tert-butyl-3-hydroxy-2,6-xylyl)methyl]-1,3,5-triazine-2,4,6-trione, 2,4-bis(n-octylthio)-6-(4-hydroxy-3,5-di-tert-butylanilino)-1,3,5-triazine, 2-tert-butyl-6-(3’-tert-butyl-5’-methyl-2’-hydroxybenzyl)-4-methylphenyl acrylate, 2-[1-(2-hydroxy-3,5-di-tert-pentylphenyl)ethyl]-4,6-di-tert-pentylphenyl acrylate, 4,6-bis[(octylthio)methyl]-o-cresol, 2,4-di-tert-butylphenyl-3,5-di-tert-butyl-4-hydroxybenzoate and 1,6-hexanediolbis[3-(3,5-di-tert-butyl-4-hydroxyphenyl) propionate].

Preferably, the lipophilic phenolic antioxidant is selected from pentaerythrityl tetra-di-t-butyl hydroxyhydrocinnamate, N,N’-hexamethylenebis(3,5-di-tert-butyl-4-hydroxyhydrocinnamide), and a mixture thereof.

Advantageously, the lipophilic phenolic antioxidant is present in amount ranging from 0.001 wt.% to 0.1 wt.%, preferably from 0.002 wt.% to 0.08 wt.%, more preferably from 0.003 wt.% to 0.05 wt.%, relative to the total weight of the composition.

Oil

According to the first aspect of the present invention, the composition comprises at least one oil.

Here, “oil” means a fatty compound or substance which is in the form of a liquid or a paste (non-solid) at room temperature (25°C) under atmospheric pressure (760 mmHg). As the oil(s), those generally used in cosmetics can be used alone or in combination thereof. These oil(s) may be volatile or non-volatile, preferably non-volatile.

The oil may be a non-polar oil such as a hydrocarbon oil, a silicone oil, or the like; a polar oil such as a plant or animal oil and an ester oil or an ether oil; or a mixture thereof.

The oil may be selected from the group consisting of oils of plant or animal origin, synthetic oils, silicone oils, hydrocarbon oils and fatty alcohols.

As examples of plant oils, mention may be made of, for example, linseed oil, camellia oil, macadamia nut oil, corn oil, mink oil, olive oil, avocado oil, sasanqua oil, castor oil, safflower oil, jojoba oil, sunflower oil, almond oil, rapeseed oil, sesame oil, soybean oil, peanut oil, and mixtures thereof.

As examples of synthetic oils, mention may be made of alkane oils such as isododecane and isohexadecane, ester oils, ether oils, and artificial triglycerides.

The ester oils are preferably liquid esters of saturated or unsaturated, linear or branched C_1-C_{26} aliphatic monoacids or polyacids and of saturated or unsaturated, linear or branched C_1-C_{26} aliphatic monoalcohols or polyalcohols, the total number of carbon atoms of the esters being greater than or equal to 10.

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

Among the monoesters of monoacids and of monoalcohols, mention may be made of ethyl palmitate, ethyl hexyl palmitate, isopropyl palmitate, dicaprylyl carbonate, alkyl myristates such as isopropyl myristate or ethyl myristate, isocetyl stearate, 2-ethylhexyl isononanoate, isononyl isononanoate, isodecyl neopentanoate and isostearyl neopentanoate.

Esters of C_4-C_{22} dicarboxylic or tricarboxylic acids and of C_1-C_{22} alcohols, and esters of monocarboxylic, dicarboxylic or tricarboxylic acids and of non-sugar C_4-C_{26} dihydroxy, trihydroxy, tetrahydroxy or pentahydroxy alcohols may also be used.

Mention may especially be made of: diethyl sebacate; isopropyl lauroyl sarcosinate; diisopropyl sebacate; bis(2-ethylhexyl) sebacate; diisopropyl adipate; di-n-propyl adipate; dioctyl adipate; bis(2-ethylhexyl) adipate; diisostearyl adipate; bis(2-ethylhexyl) maleate; triisopropyl citrate; triisocetyl citrate; triisostearyl citrate; glyceryl trilactate; glyceryl trioctanoate; trioctyldodecyl citrate; trioleyl citrate; neopentyl glycol diheptanoate; diethylene glycol diisononanoate.

As ester oils, one can use sugar esters and diesters of C_6-C_{30} and preferably C_{12}-C_{22} fatty acids. It is recalled that the term “sugar” means oxygen-bearing hydrocarbon-based compounds containing several alcohol functions, with or without aldehyde or ketone functions, and which comprise at least 4 carbon atoms. These sugars may be monosaccharides, oligosaccharides or polysaccharides.

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

The sugar esters of fatty acids may be selected especially from the group comprising the esters or mixtures of esters of sugars described previously and of linear or branched, saturated or unsaturated C_6-C_{30} and preferably C_{12}-C_{22} fatty acids. If they are unsaturated, these compounds may have one to three conjugated or non-conjugated carbon-carbon double bonds.

The esters according to this variant may also be selected from monoesters, diesters, triesters, tetraesters and polyesters, and mixtures thereof.

These esters may be, for example, oleates, laurates, palmitates, myristates, behenates, cocoates, stearates, linoleates, linolenates, caprates and arachidonates, or mixtures thereof such as, especially, oleopalmitate, oleostearate and palmitostearate mixed esters, as well as pentaerythrityl tetraethyl hexanoate.

More particularly, use is made of monoesters and diesters and especially sucrose, glucose or methylglucose monooleates or dioleates, stearates, behenates, oleopalmitates, linoleates, linolenates and oleostearates.

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

As examples of preferable ester oils, mention may be made of, for example, diisopropyl adipate, dioctyl adipate, 2-ethylhexyl hexanoate, ethyl laurate, cetyl octanoate, octyldodecyl octanoate, isodecyl neopentanoate, myristyl propionate, 2-ethylhexyl 2-ethylhexanoate, 2-ethylhexyl octanoate, 2-ethylhexyl caprylate/caprate, methyl palmitate, ethyl palmitate, isopropyl palmitate, dicaprylyl carbonate, isopropyl lauroyl sarcosinate, isononyl isononanoate, ethylhexyl palmitate, isohexyl laurate, hexyl laurate, isocetyl stearate, isopropyl isostearate, isopropyl myristate, isodecyl oleate, glyceryl tri(2-ethylhexanoate), pentaerythrithyl tetra(2-ethylhexanoate), 2-ethylhexyl succinate, diethyl sebacate, and mixtures thereof.

As examples of artificial triglycerides, mention may be made of, for example, caprylic/capric triglyceride, glyceryl trimyristate, glyceryl tripalmitate, glyceryl trilinolenate, glyceryl trilaurate, glyceryl tricaprate, glyceryl tricaprylate, and glyceryl tri(caprate/caprylate/linolenate).

As examples of silicone oils, mention may be made of, for example, linear organopolysiloxanes such as dimethylpolysiloxane, methylphenylpolysiloxane, methylhydrogenpolysiloxane, and the like; cyclic organopolysiloxanes such as cyclohexasiloxane, octamethylcyclotetrasiloxane, decamethylcyclopentasiloxane, dodecamethylcyclohexasiloxane, and the like; and mixtures thereof.

Preferably, silicone oil is selected from liquid polydialkylsiloxanes, especially liquid polydimethylsiloxanes (PDMS) and liquid polyorganosiloxanes comprising at least one aryl group.

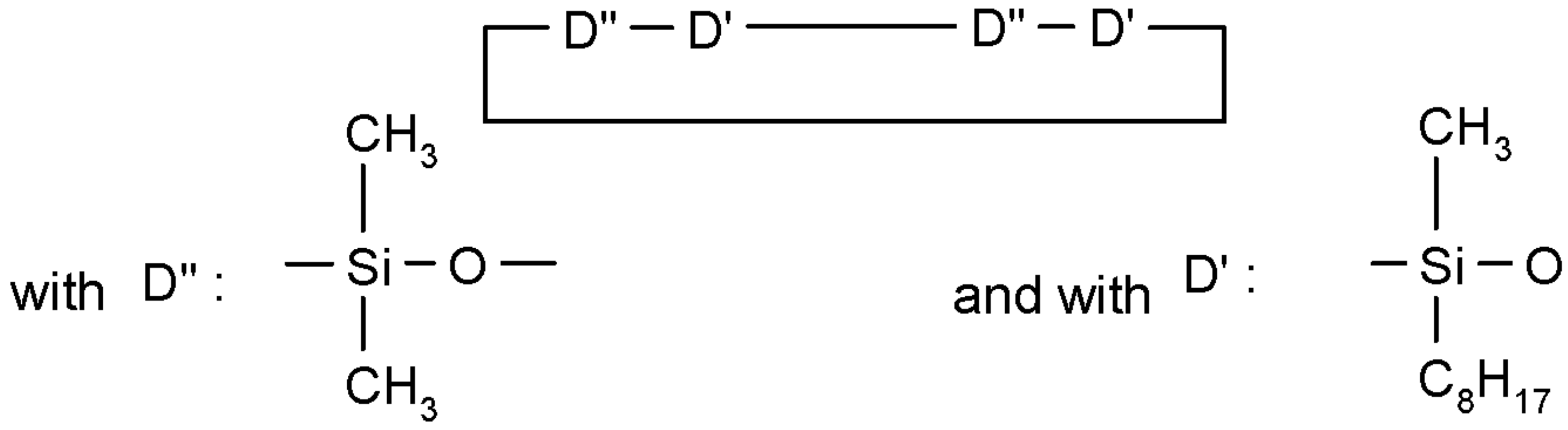
These silicone oils may also be organomodified. The organomodified silicones that can be used in accordance with the present invention are silicone oils as defined above and comprise in their structure one or more organofunctional groups attached via a hydrocarbon-based group.

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

When they are volatile, the silicones are more particularly selected from those having a boiling point of between 60°C and 260°C, and even more particularly from:

(i) cyclic polydialkylsiloxanes comprising from 3 to 7 and preferably 4 to 5 silicon atoms. These are, for example, octamethylcyclotetrasiloxane sold in particular under the name Volatile Silicone® 7207 by Union Carbide or

Silbione® 70045 V2 by Rhodia, decamethylcyclopentasiloxane sold under the name Volatile Silicone® 7158 by Union Carbide, Silbione® 70045 V5 by Rhodia, and dodecamethylcyclopentasiloxane sold under the name Silsoft 1217 by Momentive Performance Materials, and mixtures thereof. Mention may also be made of cyclocopolymers of the type such as dimethylsiloxane/methylalkylsiloxane, such as Silicone Volatile® FZ 3109 sold by the company Union Carbide, of formula:



$$-\text{Si}(\text{CH}_3)_2-\text{O}- \quad -\text{Si}(\text{CH}_3)(\text{C}_8\text{H}_{17})-\text{O}-$$

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

(ii) linear volatile polydialkylsiloxanes containing 2 to 9 silicon atoms and having a viscosity of less than or equal to 5×10^{-6} m^2/s at 25°C. An example is decamethyltetrasiloxane sold in particular under the name SH 200 by the company Toray Silicone. Silicones belonging to this category are also described in the article published in Cosmetics and Toiletries, Vol. 91, Jan. 76, pp. 27-32, Todd & Byers, *Volatile Silicone Fluids for Cosmetics*. The viscosity of the silicones is measured at 25°C according to ASTM standard 445 Appendix C.

Non-volatile polydialkylsiloxanes may also be used. These non-volatile silicones are more particularly selected from polydialkylsiloxanes, among which mention may be made mainly of polydimethylsiloxanes containing trimethylsilyl end groups.

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

- the Silbione® oils of the 47 and 70 047 series or the Mirasil® oils sold by Rhodia, for instance the oil 70 047 V 500 000;
- the oils of the Mirasil® series sold by the company Rhodia;
- the oils of the 200 series from the company Dow Corning, such as DC200 with a viscosity of 60 000 mm^2/s;
- the Viscasil® oils from General Electric and certain oils of the SF series (SF 96, SF 18) from General Electric.

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

Among the silicones containing aryl groups are polydiarylsiloxanes, especially polydiphenylsiloxanes and polyalkylarylsiloxanes. Examples that may be mentioned include the products sold under the following names:

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

The organomodified liquid silicones may especially contain polyethyleneoxy and/or polypropyleneoxy groups. Mention may thus be made of the silicone KF-6017 proposed by Shin-Etsu, and the oils Silwet® L722 and L77 from the company Union Carbide.

Hydrocarbon oils may be selected from:

- linear or branched, optionally cyclic, C_6-C_{16} lower alkanes. Examples that may be mentioned include hexane, undecane, dodecane, tridecane, and isoparaffins, for instance isohexadecane, isododecane and isodecane; and
- linear or branched hydrocarbons containing more than 16 carbon atoms, such as liquid paraffins, liquid petroleum jelly, polydecenes and hydrogenated polyisobutenes such as Parleam®, and squalane.

As preferable examples of hydrocarbon oils, mention may be made of, for example, linear or branched hydrocarbons such as isohexadecane, isododecane, squalane, mineral oil(e.g., liquid paraffin), paraffin, vaseline or petrolatum, naphthalenes, and the like; hydrogenated polyisobutene, isoeicosan, and decene/butene copolymer; and mixtures thereof.

The term “fatty” in the fatty alcohol means the inclusion of a relatively large number of carbon atoms. Thus, alcohols which have 4 or more, preferably 6 or more, and more preferably 12 or more carbon atoms are encompassed within the scope of fatty alcohols. The fatty alcohol may be saturated or unsaturated. The fatty alcohol may be linear or branched.

The fatty alcohol may have the structure R-OH wherein R is selected from saturated and unsaturated, linear and branched radicals containing from 4 to 40 carbon atoms, preferably from 6 to 30 carbon atoms, and more preferably from 12 to 20 carbon atoms. In at least one embodiment, R may be selected from C_{12}-C_{20} alkyl and C_{12}-C_{20} alkenyl groups. R may be or may not be substituted with at least one hydroxyl group.

As examples of the fatty alcohol, mention may be made of lauryl alcohol, cetyl alcohol, stearyl alcohol, isostearyl alcohol, behenyl alcohol, undecylenyl alcohol, myristyl alcohol, octyldodecanol, hexyldecanol, oleyl alcohol, linoleyl alcohol, palmitoleyl alcohol, arachidonyl alcohol, erucyl alcohol, and mixtures thereof.

It is preferable that fatty alcohol be a saturated fatty alcohol.

Thus, the fatty alcohol may be selected from straight or branched, saturated or unsaturated C_6-C_{30} alcohols, preferably straight or branched, saturated C_6-C_{30} alcohols, and more preferably straight or branched, saturated C_{12}-C_{20} alcohols.

The term “saturated fatty alcohol” here means an alcohol having a long aliphatic saturated carbon chain. It is preferable that the saturated fatty alcohol be selected from any linear or branched, saturated C_6-C_{30} fatty alcohols. Among the linear or branched, saturated C_6-C_{30} fatty alcohols, linear or branched, saturated C_{12}-C_{20} fatty alcohols may preferably be used. Any linear or branched, saturated C_{16}-C_{20} fatty alcohols may be more preferably used. Branched C_{16}-C_{20} fatty alcohols may be even more preferably used.

As examples of saturated fatty alcohols, mention may be made of isostearyl alcohol, octyldodecanol, hexyldecanol, and mixtures thereof. In one embodiment, octyldodecanol, hexyldecanol, or a mixture thereof, can be used as a saturated fatty alcohol.

According to at least one embodiment, the fatty alcohol used in the composition according to the present invention is preferably selected from octyldodecanol, hexyldecanol and mixtures thereof.

It is preferable that the oil be selected from polar oils, more preferably ester oils. In other words, it is preferable that the oil comprise at least one polar oil, and more preferably at least one ester oil.

In a preferred embodiment, the oil is selected from branched alkane oils containing from 8 to 16 carbon atoms and better still from 10 to 16 carbon atoms such as isododecane, triglycerides, polydimethylsiloxanes optionally containing dimethylsilanol end groups, and a mixture thereof, so as to give keratin fibres a clean feel, i.e. not oily, not sticky and not greasy.

In a preferred embodiment, the oil in the composition according to the present invention comprises from 50 wt.% to 70 wt.% of branched alkane oils containing from 8 to 16 carbon atoms, from 10 wt.% to 40 wt.% of triglycerides, from 5 wt.% to 35 wt.% of polydimethylsiloxanes optionally containing dimethylsilanol end groups.

Advantageously, the oil is present in amount ranging from 95 wt.% to 99 wt.%, preferably from 96 wt.% to 98.5 wt.%, more preferably from 96.5 wt.% to 98 wt.%, relative to the total weight of the composition.

It is preferable that the composition according to the present invention be anhydrous.

The term “anhydrous” here means that the composition according to the present invention may contain only a small amount of water, preferably no water. Thus, the amount of water may be 2 wt.% or less, preferably 1.5 wt.% or less, and more preferably 1 wt.% or less relative to the total weight of the composition. It is particularly preferable that the cosmetic composition according to the present invention contains no water.

Copolymer containing a silicone resin segment and a fluid silicone segment

According to a preferred embodiment, the composition according to the invention further comprises at least one copolymer containing a silicone resin segment and a fluid silicone segment, also called as “silicone copolymer” in the present application.

The silicone copolymer is derived from the reaction between a silicone resin and a fluid silicone. These copolymers are described in patent applications WO 03/026 596, WO 2004/073 626, WO 2007/051 505 and WO 2007/051 506 for various cosmetic applications on hair and nails and for pharmaceutical applications on the skin.

Such copolymers are also described, for example, in “Silicone Pressure Sensitive Adhesive”, *Sobieski and Tangney*, Handbook of Pressure Sensitive Adhesive Technology (D. Satas Ed.), Von Nostrand Reinhold, New York.

Silicone Resin Segment

According to one of the embodiments of the invention, the silicone resin segment of the copolymer is a MQ type silicone resin. Examples of such MQ type silicone resins, include, but are not limited to: (i) the alkyl siloxysilicates of formula $[(R1)_3SiO_{1/2}]_x(SiO_{4/2})_y$ (MQ units) in which x and y are integers ranging from 50 to 80, and the group R1 represents a hydrocarbon-based radical containing from 1 to 10 carbon atoms, a phenyl group, a phenylalkyl group or a hydroxyl group, and preferably is an alkyl group containing from 1 to 8 carbon atoms, preferably a methyl group; and (ii) phenylalkyl siloxysilicate resins, the alkyl of the phenylalkyl is as defined above, such as phenylpropyldimethyl siloxysilicate.

Examples of such MQ type silicone resins also include, but are not limited to, trimethyl siloxysilicate type, such as those sold under the reference SR1000 by the company General Electric, under the reference TMS 803 by the company Wacker, or under the name KF-7312J by the company Shin-Etsu or DC 749 or DC 593 by the company Dow Corning.

Examples of such MQ type silicone resins further include, but are not limited to, MQ siloxysilicate units, such as phenylalkylsiloxysilicate resins like phenylpropyldimethylsiloxysilicate (Silshine 151 sold by the company General Electric).

Fluid silicone segment

According to one embodiment of the invention, the fluid silicone segment of the copolymer according to the invention bears an OH end function group.

Preferably, the fluid silicone segment is a diorganopolysiloxane bearing OH end functions, having a viscosity of between 100 and 100,000 cSt at 25°C (determined with Brookfield viscometer using ASTMD-445 method), for which the substituent(s) of the diorganopolysiloxane are independently chosen from methyl, ethyl, propyl and vinyl radicals. The diorganopolysiloxanes are preferably linear polymers. Examples of diorganopolysiloxanes may be, in a non-limiting manner, a polydimethylsiloxane, an ethylmethyl polysiloxane, a copolymer of dimethylsiloxane and of methylvinylsiloxane, and mixtures of such polymers or copolymers containing OH end groups. The preferred diorganopolysiloxane is a polydimethylsiloxane.

For example, the copolymers according to the present invention may be prepared by heating the following mixture of:

- from 45% to 75% by mass of silicone resin, being the product of condensation of SiO_2 and $R_3(SiO)_{1/2}$ units for which each group R is independently selected from methyl, ethyl, propyl and vinyl radicals and for which the ratio between the SiO_2 functions and the $R_3(SiO)_{1/2}$ functions of the silicone resin ranges from 0.6 to 0.9;
- from 25% to 55% by mass of fluid diorganopolysiloxane containing OH end functions, with a viscosity of between 100 and 100,000 cSt at 25°C (determined with Brookfield viscometer using ASTMD-445 method), for which the substituents of the diorganopolysiloxane are independently chosen from methyl, ethyl, propyl and vinyl radicals; and
- from 0.001% to 5% of a suitable catalyst, which is preferably an organic aliphatic amine compound preferably chosen from primary amines, secondary amines, tertiary amines, carboxylic acid salts of the amines mentioned above and quaternary ammonium salts.

The mixture is heated to a temperature of between 80°C and 160°C until the adhesive nature of the resulting silicone copolymer is obtained.

In the copolymer, the silicone resin is present in a content of between 45% and 75% (relative to the total mass of silicone) and the fluid silicone is present in a content of between 25% and 55%, the sum of the percentages of silicone resin and of fluid silicone being equal to 100. Preferably, the silicone resin is present in a content of between 55% and 65% (relative to the total mass of silicone) and the fluid silicone is present in a content of between 35% and 45%, the sum of the percentages of silicone resin and of fluid silicone being equal to 100.

The copolymers that are preferred according to the invention are sold by Dow Corning under the reference Bio-PSA® and DOWSIL ™. Mention may be made especially of the grades 7-4400, 7-4405, 7-4500 and 7-4600 for Bio-PSA® and FC-5001 CM Resin Gum, FC-5002 IDD Resin Gum and FC-5004 DM Resin Gum for DOWSIL™.

Advantageously, the copolymer containing a silicone resin segment and a fluid silicone segment is present in an amount ranging from 0.5 wt.% to 8 wt.%, preferably from 0.8 wt.% to 6 wt.%, more preferably from 1 wt.% to 4 wt.%, relative to the weight of the composition.

It was found that with the incorporation of a copolymer containing a silicone resin segment and a fluid silicone segment, the composition of the present invention can make the keratin fibers more manageable.

As used herein, the term “manageable” means the hair is aligned, curl of the hair are regular and remained.

Additional ingredients

The composition according to the present invention is advantageously a cosmetic composition.

The composition according to the present invention may also comprise an effective amount of other ingredients, known previously elsewhere in cosmetic compositions, such as various common adjuvants, vitamins or provitamins, for instance, panthenol, opacifiers, fragrances, plant extracts, thickeners, cationic polymers and so on.

According to a preferred embodiment, the present invention provides a composition for conditioning keratin fibres comprising, relative to the total weight of the composition:

a) from 0.002 wt.% to 0.1 wt.% at least one lipophilic dye selected from D&C Violet 2 (C.I. 60725), beta-carotene (C.I. 75130), Green 6 (C.I. 61565), astaxanthin, and a mixture thereof;

b) from 0.03 wt.% to 0.3 wt.% at least one lipophilic UV filter selected from bumetrizole, drometrizole trisiloxane, a mixture thereof;

c) from 0.003 wt.% to 0.05 wt.% at least one lipophilic phenolic antioxidants selected from pentaerythrityl tetra-di-t-butyl hydroxyhydrocinnamate, N,N’-hexamethylenebis(3,5-di-tert-butyl-4-hydroxyhydrocinnamide), and a mixture thereof, and

d) at least one oil selected from branched alkane oils containing from 8 to 16 carbon atoms, triglycerides, polydimethylsiloxanes optionally containing dimethylsilanol end groups, and a mixture thereof.

It was found that the composition according to the preferred embodiment is stable under light and/or elevated temperature of 50 °C for at least 24 hours,can provide a color retouch effect on keratin fibres and give keratin fibres a clean feel.

Preparation and use

The composition according to the present invention can be prepared by mixing ingredients a) to d), as essential ingredients, as well as optional ingredient(s), as explained above.

The method and means to mix the above essential and optional ingredients are not limited. Any conventional method and means can be used to mix the above essential and optional ingredients to prepare the composition according to the present invention.

The composition according to the present invention can be uniform.

The composition according to the present invention can be a conditioner, a leave-on product, for example, a leave-on oil.

The use of the composition can be done on wet or dry hair.

According to the second aspect of the present invention, a cosmetic process for conditioning keratin fibers comprising applying the composition as described above onto the keratin materials.

The following examples are given by way of illustration of the present invention and shall not be interpreted as limiting the scope.

EXAMPLES

Example 1: Formulation of leave-on oils

Leave-on oils according to invention formulas (Inv.) 1-2 and comparative formulas (comp.) 1-3 were prepared (the contents are expressed as weight percentages of active material with regard to the total weight of each leave-on oil, unless otherwise indicated):

INCI US	Inv.1	Inv.2	Comp.1	Comp. 2	Comp.3
ISODODECANE(Isododecane from INEOS)	QS 100	QS 100	QS 100	QS 100	QS 100
CAPRYLIC/CAPRIC TRIGLYCERIDE(DUB MCT 7030/MB from STEARINERIE DUBOIS)	20	20	20	20	20
DIMETHICONE 5CST(BELSIL® DM 5 PLUS DIMETHICONE from WACKER)	4	4	4	4	4

DIMETHICONE 500 000 CST(XIAMETER® PMX-200 SILICONE FLUID 500000 CST from DOW CORNING (DOW CHEMICAL))	4	4	4	4	4
TRIMETHYLSILOXYSILICATE/DIMETHICONOL CROSSPOLYMER (DOWSIL FC-5004 DM(1.5CST) SILICONE RESIN GUM from DOW CORNING (DOW CHEMICAL))	2	-	2	2	2
DIMETHICONOL(DOWSIL™ XX-1515 GUM from DOW CORNING (DOW CHEMICAL))	6	6	6	6	6
HAEMATOCOCCUS PLUVIALIS EXTRACT (ASTA TROL-X from FUJI CHEMICAL)	0.06	0.06	0.06	0.06	0.06
GREEN 6(CI 61565)	0.004	0.004	0.004	0.004	0.004
VIOLET 2(CI 60725)	0.01	0.01	0.01	0.01	0.01
BETA-CAROTENE(CI 40800)	0.003	0.003	0.003	0.003	0.003
PENTAERYTHRITYL TETRA-DI-T-BUTYL HYDROXYHYDROCINNAMATE(TINOGARD TT from BASF)	0.01	0.01	–	0.01	-
CARNOSINE (DRAGOSINE from SYMRISE)	–	–	0.01	-	-
BUMETRIZOLE(TINOGARD AS from BASF)	0.1	0.1	0.1	-	0.1
BIS-ETHYLHEXYLOXYPHENOL METHOXYPHENYL TRIAZINE (ESCALOL S from ISP (ASHLAND))	-	-	-	-	0.05
OCTOCRYLENE (600154 NEO HELIOPAN 303 from SYMRISE)	-	-	–	0.1	–

Leave-on oil of invention formula 1 is a leave-on oil according to the present invention, further comprising a silicone copolymer.

Leave-on oil of invention formula 2 is a leave-on oil according to the present invention.

Leave-on oil of Comp.1 comprises carnosine instead of lipophilic phenolic antioxidant.

Leave-on oil of Comp.2 does not comprise any UV filter.

Leave-on oil of Comp.3 does not comprise any antioxidant.

The leave-on oils listed above were prepared by cold mixing all ingredients together evenly.

Example 2: Evaluation of leave-on oils

The stability under UV light and elevated temperature was evaluated for leave-on oils prepared in Example 1.

The leave-on oil to be tested was exposed to 2 conditions in parallel: UV light for 24 hours to test UV stability, and 50 °C oven for 2 weeks to test temperature stability.

Any change in color indicates that the tested leave-on oil is not stable. No change in color indicates the leave-on oil is stable.

If the leave-on oil is stable under UV light and under elevated temperature, then the result is stable.

If the leave-on oil is not stable under UV light and/or under elevated temperature, then the result is not stable stable.

The results for each leave-on oil were summarized in the following table.

	Inv.1	Inv.2	Comp.1	Comp.2	Comp.3
Stability (under UV light and elevated temperature)	stable	stable	unstable	unstable	Unstable

It can be seen from above table that the leave-on oils according to the present invention (Inv.1 and Inv.2) was stable under light and elevated temperature.

Through a consumer test, it was also found that the leave-on oils of invention formulas 1 and 2 can provide a color retouch effect on the hair and give the hair a clean feel.

In addition, the leave-on oil of invention formula 1 makes the hair more manageable.

Claims

1. A composition for conditioning keratin fibres, comprising:
a) at least one lipophilic dye;
b) at least one lipophilic UV filter;
c) at least one lipophilic phenolic antioxidant; and
d) at least one oil.

2. Composition according to claim 1, wherein the lipophilic dye is selected from DC Red 17, DC Red 21, DC Red 27, DC Green 6, DC Yellow 11, DC Violet 2, DC Orange 5, Sudan Red, Sudan brown, quinoline yellow, annatto, curcumin, carotenes, xanthophylls, lipophilic green dyes and a mixture thereof.

3. Composition according to claim 1 or 2, wherein the lipophilic dye is present in amount ranging from 0.001 wt.% to 1 wt.%, preferably from 0.002 wt.% to 0.5 wt.%, more preferably from 0.002 wt.% to 0.1 wt.%, relative to the total weight of the composition.

4. Composition according to any of claims 1-3, wherein the lipophilic UV filter is selected from is selected from butylmethoxydibenzoylmethane, ethyl p-aminobenzoic acid, ethyl dihydroxypropyl p-aminobenzoic acid, ethylhexyl dimethyl p-aminobenzoic acid, homosalate, ethylhexyl salicylate, ethylhexyl methoxycinnamate, isopropyl methoxycinnamate, isoamyl methoxycinnamate, cinoxate, diisopropyl methylcinnamate, octocrylene, etocrylene, benzophenone-1, benzophenone-2, benzophenone-3, benzophenone-6, benzophenone-8, benzophenone-12, n-hexyl 2-(4-diethylamino-2-hydroxybenzoyl)benzoate, 3-benzylidene camphor, 4-methylbenzylidenecamphor, polyacrylamidomethylbenzylidenecamphor, drometrizole trisiloxane, bumetrizole, ethylhexyl triazone, diethylhexyl butamido triazone, menthyl anthranilate, ethylhexyl dimethoxybenzylidene dioxoimidazoline propionate, dineopentyl 4'-methoxybenzalmalonate, 1,1-dicarboxy(2,2'-dimethylpropyl)-4,4-diphenylbutadiene,octyl 5-N,N-diethylamino-2-phenylsulfonyl-2,4-pentadienoate and a mixture thereof.

5. Composition according to any of claims 1-4, wherein the lipophilic UV filter is selected from butylmethoxydibenzoylmethane, ethylhexyl methoxycinnamate, Octocrylene, ethylhexyl salicylate, n-Hexyl 2-(4-diethylamino-2-hydroxybenzoyl)benzoate, ethylhexyl triazone, diethylhexyl Butamido Triazone, Drometrizole trisiloxane, Bumetrizole, and a mixture thereof.

6. Composition according to any of claims 1-5, wherein the lipophilic UV filter is present in amount ranging from 0.01 wt.% to 1 wt.%, preferably from 0.02 wt.% to 0.6 wt.%, more preferably from 0.03 wt.% to 0. 3 wt.%, relative to the total weight of the composition.

7. Composition according to any of claims 1-6, wherein the phenolic antioxidant is selected from pentaerythrityl tetra-di-t-butyl hydroxyhydrocinnamate, 2,6-di-tert-butyl-4-methylphenol, 2,6-di-tert-butyl-4-ethylphenol, mono- or di- or tri-(α-methylbenzyl)phenol, 2,2'-methylenebis(4-ethyl-6-tert-butylphenol), 2,2'-methylenebis(4-methyl-6-tert-butylphenol), 4,4'-butylidenebis(3-methyl-6-tert-butylphenol), 4,4'-thiobis(3-methyl-6-tert-butylphenol), 2,5-di-tert-butylhydroquinone, 2,5-di-tert-amylhydroquinone, tris[N-(3,5-di-tert-butyl-4-hydroxybenzyl)]isocyanurate, 1,1,3-tris(2-methyl-4-hydroxy-5-tert-butylphenyl)butane, butylidene-1,1bis[3-(3-tert-butyl-4-hydroxy-5-methylphenyl)propionate], octadecyl 3-(3,5-di-tert-butyl-4-hydroxyphenyl)propionate, tetrakis[methylene-3-(3,5-di-tert-butyl-4-hydroxyphenyl)propionato]methane, triethylene glycol bis[3-(3-tert-butyl-4-hydroxy-5-methylphenyl)propionate], 3,9-bis{2-[3-(3-tert-butyl-4-hydroxy-5-methylphenyl)propionyloxy]-1,1-dimethylethyl}-2,4,8,10-tetraoxaspiro [5.5]undecane, 1,3,5-trimethyl-2,4,6-tris(3,5-di-tert-butyl-4-hydroxybenzyl)benzene, 2,2-thiodiethylenebis[3-(3,5-di-tert-butyl-4-hydroxyphenyl)propionate], N,N'-hexamethylenebis(3,5-di-tert-butyl-4-hydroxyhydrocinnamide), 1,6-hexanediol bis[3-(3,5-di-tert-butyl-4-hydroxyphenyl)propionate], 1,3,5-tris[(4-tert-butyl-3-hydroxy-2,6-xylyl)methyl]-1,3,5-triazine-2,4,6-trione, 2,4-bis(n-octylthio)-6-(4-hydroxy-3,5-di-tert-butylanilino)-1,3,5-triazine, 2-tert-butyl-6-(3'-tert-butyl-5'-methyl-2'-hydroxybenzyl)-4-methylphenyl acrylate, 2-[1-(2-hydroxy-3,5-di-tert-pentylphenyl)ethyl]-4,6-di-tert-pentylphenyl acrylate, 4,6-bis[(octylthio)methyl]-o-cresol, 2,4-di-tert-butylphenyl-3,5-di-tert-butyl-4-hydroxybenzoate and 1,6-hexanediolbis[3-(3,5-di-tert-butyl-4-hydroxyphenyl) propionate].

8. Composition according to any of claims 1-7, wherein the lipophilic phenolic antioxidant is present in amount ranging from 0.001 wt.% to 0.1 wt.%, preferably from 0.002 wt.% to 0.08 wt.%, more preferably from 0.003 wt.% to 0.05 wt.%, relative to the total weight of the composition.

9. Composition according to any of claims 1-8, wherein the oil is selected from branched hydrocarbons, triglycerides, polydimethylsiloxanes optionally containing dimethylsilanol end groups, a mixture thereof.

10. Composition according to any of claims 1-9, wherein the oil is present in amount ranging from 95 wt.% to 99 wt.%, preferably from 96 wt.% to 98.5 wt.%, more preferably from 96.5 wt.% to 98 wt.%, relative to the total weight of the composition.

11. Composition according to any of claims 1-10, wherein the composition according to the present invention is anhydrous.

12. Composition according to any of claims 1-11, further comprising at least one copolymer containing a silicone resin segment and a fluid silicone segment.

13. Composition according to claim 12, wherein the silicone resin is present in an amount ranging from 0.5 wt.% to 8 wt.%, preferably 0.8 wt.% to 6 wt.%, more preferably 1 wt.% to 4 wt.%, relative to the weight of the composition.

14. Composition according to claim 1 for conditioning keratin fibres comprising, relative to the total weight of the composition:

a) from 0.002 wt.% to 0.1 wt.% at least one lipophilic dye selected from D&C Violet 2 (C.I. 60725), beta-carotene (C.I. 75130), Green 6 (C.I. 61565), astaxanthin, and a mixture thereof;

b) from 0.03 wt.% to 0.3 wt.% at least one lipophilic UV filter selected from bumetrizole, drometrizole trisiloxane, a mixture thereof;

c) from 0.003 wt.% to 0.05 wt.% at least one lipophilic phenolic antioxidants selected from pentaerythrityl tetra-di-t-butyl hydroxyhydrocinnamate, N,N'-hexamethylenebis(3,5-di-tert-butyl-4-hydroxyhydrocinnamide), and a mixture thereof, and

d) at least one oil selected from branched alkane oils containing from 8 to 16 carbon atoms, triglycerides, polydimethylsiloxanes optionally containing dimethylsilanol end groups, and a mixture thereof.

15. A cosmetic process for conditioning keratin fibres comprising applying a composition as defined in any of claims 1 to 14 onto said keratin fibres.

INTERNATIONAL SEARCH REPORT

International application No.

PCT/CN2019/128199

A. CLASSIFICATION OF SUBJECT MATTER

A61K 8/49(2006.01)i; A61K 8/37(2006.01)i; A61K 8/92(2006.01)i; A61Q 17/04(2006.01)i; A61Q 5/00(2006.01)i

According to International Patent Classification (IPC) or to both national classification and IPC

B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)

A61K8/-;A61K7/-;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)

CNTXT,CNABS,CNKI,DWPI,VEN,EPTXT,WOTXT,USTXT,STN,ISI WEB OF SCIENCE:L'OREAL, Dye, pigment, colorant, Sunscreen, UV,bumetrizole,Tinogard AS, +trizole, triazone,triazine, antioxidant, phenolic s antioxidant, Tinogard w TT, pentaerythrityl tetra-di-t-butyl hydroxyhydrocinnamate,oil, A61K7/ic ,A61K8/ic

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	US 2011123464 A1 (BASF. SE.) 26 May 2011 (2011-05-26) example B8, paragraph 0016	1-15
X	US 2009092561 A1 (LUPIA JOSEPH A. et al.) 09 April 2009 (2009-04-09) paragraphs 0073, 0075, 0130, 0215, 0217-0218, 0229	1-15
X	US 2013251650 A1 (WINKLER BARBARA et al.) 26 September 2013 (2013-09-26) examples B5, B8	1-15
X	US 2011293543 A1 (YU WEI) 01 December 2011 (2011-12-01) claim 1, example 1	1-15
X	US 2012121524 A1 (MUELLER STEFAN et al.) 17 May 2012 (2012-05-17) description, page13, claim 1	1-15

☐ 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 **07 September 2020**	Date of mailing of the international search report **25 September 2020**
Name and mailing address of the ISA/CN **National Intellectual Property Administration, PRC** **6, Xitucheng Rd., Jimen Bridge, Haidian District, Beijing 100088** **China** Facsimile No. **(86-10)62019451**	Authorized officer **CHEN,Hongxia** Telephone No. **86-(10)-53962092**

INTERNATIONAL SEARCH REPORT
Information on patent family members

International application No.
PCT/CN2019/128199

Patent document cited in search report	Publication date (day/month/year)	Patent family member(s)	Publication date (day/month/year)
US 2011123464 A1	26 May 2011	JP 2011526278 A	06 October 2011
		EP 2303222 B1	24 April 2013
		CN 102076321 A	25 May 2011
		ES 2412756 T3	12 July 2013
		MX 2010013422 A	25 February 2011
		KR 20110023902 A	08 March 2011
		WO 2009156340 A1	30 December 2009
		TW 201008589 A	01 March 2010
		US 8623946 B2	07 January 2014
		EP 2303222 A1	06 April 2011
		TW I484979 B	21 May 2015
US 2009092561 A1	09 April 2009	CN 104586637 A	06 May 2015
		ES 2766255 T3	12 June 2020
		EP 2207522 B1	06 November 2019
		TW I441652 B	21 June 2014
		JP 2015042657 A	05 March 2015
		JP 2011502107 A	20 January 2011
		KR 20100086997 A	02 August 2010
		WO 2009047150 A2	16 April 2009
		BR PI0819087 B1	16 November 2016
		WO 2009047150 A3	02 September 2010
		TW 200924799 A	16 June 2009
		PL 2207522 T3	18 May 2020
		CN 102014856 A	13 April 2011
		EP 2207522 A2	21 July 2010
		MX 345135 B	18 January 2017
		JP 6097734 B2	15 March 2017
		JP 5732254 B2	10 June 2015
		BR PI0819087 A2	07 October 2014
		MX 2010003353 A	09 April 2010
		KR 20160092050 A	03 August 2016
US 2013251650 A1	26 September 2013	WO 2009027258 A2	05 March 2009
		US 8454940 B2	04 June 2013
		JP 6324882 B2	16 May 2018
		TW I488649 B	21 June 2015
		KR 20150110830 A	02 October 2015
		CN 101808615 B	15 May 2013
		EP 2178491 B1	22 March 2017
		BR PI0816128 B1	11 October 2016
		CN 101808615 A	18 August 2010
		PL 2178491 T3	29 September 2017
		KR 101721787 B1	30 March 2017
		JP 2018104421 A	05 July 2018
		ES 2629093 T3	07 August 2017
		TW 200909000 A	01 March 2009
		EP 2178491 A2	28 April 2010
		JP 2015091810 A	14 May 2015
		BR PI0816128 A2	07 October 2014
		JP 2010536822 A	02 December 2010
		KR 20100063084 A	10 June 2010

Patent document cited in search report			Publication date (day/month/year)	Patent family member(s)			Publication date (day/month/year)
				WO	2009027258	A3	23 April 2009
				US	2011200540	A1	18 August 2011
US	2011293543	A1	01 December 2011	BR	112012030137	A2	05 December 2017
				WO	2011150034	A2	01 December 2011
				WO	2011150034	A3	11 July 2013
				CN	103221020	A	24 July 2013
				EP	2575741	A2	10 April 2013
US	2012121524	A1	17 May 2012	US	2010143272	A1	10 June 2010
				JP	5384826	B2	08 January 2014
				KR	20070058518	A	08 June 2007
				US	8119107	B2	21 February 2012
				CN	101031277	A	05 September 2007
				EP	1793798	B1	20 April 2016
				ES	2582485	T3	13 September 2016
				CN	101031277	B	05 December 2012
				JP	2008514672	A	08 May 2008
				MX	2007003356	A	05 March 2008
				AU	2005288930	A1	06 April 2006
				BR	PI0516174	B1	16 June 2015
				KR	101269995	B1	31 May 2013
				BR	PI0516174	A	26 August 2008
				EP	1793798	A1	13 June 2007
				AU	2005288930	B2	23 June 2011
				WO	2006034968	A1	06 April 2006