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

(19) World Intellectual Property Organization
International Bureau

(43) International Publication Date
09 May 2019 (09.05.2019)

WIPO | PCT

(10) International Publication Number
WO 2019/087990 A1

(51) International Patent Classification:
A61K 8/34 (2006.01) *A61Q 19/00* (2006.01)
A61K 8/73 (2006.01)

(21) International Application Number:
PCT/JP2018/040010

(22) International Filing Date:
23 October 2018 (23.10.2018)

(25) Filing Language: English

(26) Publication Language: English

(30) Priority Data:
2017-210240 31 October 2017 (31.10.2017) JP

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

(72) Inventors; and
(71) Applicants *(for AL only)*: **HAMAZAKI, Tomomi** [JP/JP]; c/o Nihon L'Oreal K.K., KSP R&D, 3-2-1, Sakado, Takatsu-ku, Kawasaki-shi, Kanagawa, 2130012 (JP). **KOIKE, Toru** [JP/JP]; c/o Nihon L'Oreal K.K., KSP R&D, 3-2-1, Sakado, Takatsu-ku, Kawasaki-shi, Kanagawa, 2130012 (JP).

(74) Agent: **MURAYAMA, Yasuhiko** et al.; 1-9-2, Marunouchi, Chiyoda-ku, Tokyo, 1006620 (JP).

(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, 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 2019/087990 A1

(54) **Title:** COMPOSITION WITH COOLING EFFECTS

(57) **Abstract:** The present invention relates to a composition preferably a cosmetic composition, and more preferably a skin cosmetic composition, comprising: (a) at least one endothermic substance; (b) at least one compound selected from menthol and derivatives thereof; and (c) at least one compound selected from cyclodextrin and derivatives thereof. The composition according to the present invention can provide sufficient immediate cooling, long-lasting cooling, and re-cooling effects.

DESCRIPTION

COMPOSITION WITH COOLING EFFECTS

TECHNICAL FIELD

The present invention relates to a composition including a combination of specific ingredients, in particular a cosmetic composition for the skin, as well as a cosmetic method using the same.

BACKGROUND ART

Heat or a hot sensation is one of the enemies of beauty because it causes the production of sweat and sebum which may deteriorate, for example, make-up. Therefore, there have been some proposals to provide cosmetic products with cooling effects.

One of the proposals is to include a chemical substance such as menthol which can cause a cooling sensation. This chemical substance can provide immediate cooling effects. However, the cooling effects do not last for a long period of time.

Thus, there has been a need for a cosmetic product which can provide not only immediate cooling effects but also long-lasting cooling effects.

Also, there has been another need for a cosmetic product which can provide re-cooling effects when, for example, users of the cosmetic product sweat, after the initial cooling effects by the cosmetic product are lost after a long period of time.

DISCLOSURE OF INVENTION

An objective of the present invention is to provide a composition which can provide sufficient immediate cooling, long-lasting cooling, and re-cooling effects.

The above objective can be achieved by a composition, preferably a cosmetic composition, and more preferably a skin cosmetic composition, comprising:

(a) at least one endothermic substance;
(b) at least one compound selected from menthol and derivatives thereof; and
(c) at least one compound selected from cyclodextrin and derivatives thereof.

The (a) endothermic substance may be selected from sugar alcohols.

The (a) endothermic substance may be selected from the group consisting of mannitol, erythritol, xylitol, sorbitol, arabitol, pentaerythritol, and mixtures thereof.

The amount of the (a) endothermic substance in the composition according to the present invention may be from 0.01 to 30% by weight, preferably from 0.1 to 20% by weight, and more preferably from 1 to 10% by weight, relative to the total weight of the composition.

The (b) compound may be selected from esters and ethers of menthol, preferably carboxylates and glyceryl ethers, and more preferably menthoxypropanediol.

The amount of the (b) compound(s) in the composition according to the present invention

may be from 0.001 to 20% by weight, preferably from 0.01 to 10% by weight, and more preferably from 0.1 to 1% by weight, relative to the total weight of the composition.

The (c) compound may be selected from α-cyclodextrin, β-cyclodextrin, γ-cyclodextrin and mixtures thereof, preferably β-cyclodextrin.

The amount of the (c) compound in the composition according to the present invention may be from 0.01 to 30% by weight, preferably from 0.1 to 20% by weight, and more preferably from 1 to 10% by weight, relative to the total weight of the composition.

The composition according to the present invention may further comprise (d) water.

The amount of the (d) water in the composition according to the present invention may be from 10% to 80% by weight, preferably from 20% to 70% by weight, and more preferably from 30% to 60%% by weight, relative to the total weight of the composition.

The composition according to the present invention may further comprise (e) at least one oil.

The composition according to the present invention may further comprise (f) at least one UV filter, preferably organic UV filter.

The composition according to the present invention may be in the form of an emulsion, preferably in the form of an O/W emulsion.

The present invention also relates to a cosmetic process for a keratin substance, preferably the skin, comprising applying to the keratin substance the composition according to the present invention.

The present invention also relates to a use of a combination of
(a) at least one endothermic substance,
(b) at least one compound selected from menthol and derivatives thereof, and
(c) at least one compound selected from cyclodextrin and derivatives thereof
in a composition in order to make the composition capable of providing sufficient immediate cooling, long-lasting cooling, and re-cooling effects.

BEST MODE FOR CARRYING OUT THE INVENTION

After diligent research, the inventors have discovered that it is possible to provide a composition, preferably a cosmetic composition, and more preferably a skin cosmetic composition, which can provide sufficient immediate cooling, long-lasting cooling, and re-cooling effects.

Thus, the composition according to the present invention comprises:
(a) at least one endothermic substance;
(b) at least one compound selected from menthol and derivatives thereof; and
(c) at least one compound selected from cyclodextrin and derivatives thereof.

The composition according to the present invention can provide sufficient immediate cooling, long-lasting cooling, and re-cooling effects. All of the three cooling effects are sufficient.

The term "cooling effect" here means not only a sensation of cooling but also an actual decrease in

temperature of a subject such as a keratin substance, preferably the skin, to which the composition according to the present invention has been applied.

The term "re-cooling" here means that even after initial cooling effects on a subject such as a keratin substance, preferably the skin, when the composition according to the present invention is applied to the subject, are lost, cooling effects are exerted again when water is provided to the subject, for example, by sweating or wetting with water or humid condition.

The cooling effects provided by the composition according to the present invention can be superior, in consideration of all the immediate cooling, long lasting cooling and re-cooling effects, to those provided by a composition in which any one of the ingredients (a), (b) and (c) is not included. For example, even if one of the three cooling effects provided by the composition according to the present invention were the same as or similar to that provided by the composition in which any one of the ingredients (a), (b) and (c) is not included, the other two of the three cooling effects provided by the former can be enhanced or improved as compared to those provided by the latter. Also, even if two of the three cooling effects provided by the composition according to the present invention were the same as or similar to those provided by the composition in which any one of the ingredients (a), (b) and (c) is not included, the other one of the three cooling effects provided by the former can be enhanced or improved as compared to that provided by the latter.

Furthermore, the cooling effects provided by the composition according to the present invention can be, preferably synergistically, enhanced or improved in consideration of all the immediate cooling, long lasting cooling and re-cooling effects as compared to those provided by a composition in which any one of the ingredients (a), (b) and (c) is not included.

Hereafter, the composition according to the present invention will be described in a detailed manner.

[Endothermic Substance]

The composition according to the present invention includes at least one (a) endothermic substance. If two or more (a) endothermic substances are used, they may be the same or different.

The (a) endothermic substance here means a substance which can cause an endothermic reaction.

The (a) endothermic substance may be in the form of a powder, a paste or a liquid at room temperature and under atmospheric pressure.

There is no limitation to the type of the (a) endothermic substance. Thus, any organic and inorganic compounds may be used as the (a) endothermic substance as long as they can cause an endothermic reaction.

Examples of the (a) endothermic substance include inorganic salts such as sodium chloride and potassium chloride, nitrogen-containing compounds such as urea, and sugar alcohols.

It may be preferable that the (a) endothermic substance be selected from sugar alcohols.

The term "sugar alcohol" here means a compound obtained by the reduction of the possible ketone or aldehyde group of a sugar to an alcohol group. Thus, a sugar alcohol has several alcohol functions.

The term "sugar" here means an oxygen-bearing hydrocarbon-based compound containing several alcohol functions, with or without aldehyde or ketone functions, and which contains 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, fructose, maltose, mannose, arabinose, xylose, trehalose, and lactose, and derivatives thereof, especially alkyl derivatives, such as methyl derivatives, for instance methylglucose.

Thus, examples of suitable sugar alcohols that may be mentioned include mannitol, erythritol, xylitol, sorbitol, arabitol, pentaerythritol, and mixtures thereof.

The amount of the (a) endothermic substance(s) in the composition according to the present invention may be 0.01% by weight or more, preferably 0.1% by weight or more, more preferably 1% by weight or more, and even more preferably 2% by weight or more, relative to the total weight of the composition.

On the other hand, the amount of the (a) endothermic substance(s) in the composition according to the present invention may be 30% by weight or less, preferably 20% by weight or less, more preferably 10% by weight or less, and even more preferably 5% by weight or less, relative to the total weight of the composition.

The amount of the (a) endothermic substance(s) in the composition according to the present invention may range from 0.01% to 30% by weight, preferably from 0.1% to 20% by weight, more preferably from 1% to 10% by weight, and even more preferably from 2% to 5% by weight, relative to the total weight of the composition.

[Menthol and Derivatives Thereof]

The composition according to the present invention includes at least one (b) compound selected from menthol and derivatives thereof. If two or more the (b) compounds are used, they may be the same or different.

As menthol, l-menthol or dl-menthol may be used.

The derivatives of menthol may be esters and ethers.

The esters of menthol may be mono-esters of menthol and monovalent carboxylic acid, such as menthyl acetate and menthyl pyrrolidonecarboxylate; mono-esters of menthol and monovalent hydroxycarboxylic acid, such as menthyl lactate and menthyl hydroxybutylate; mono-esters of menthol and divalent carboxylic acid, such as monomenthyl succinate and monomenthyl glutarate; di-esters of menthol and divalent carboxylic acid, such as dimenthyl succinate and dimenthyl glutarate; menthyl ethylamido oxalate; and mixtures thereof.

The ethers of menthol may be mono-ethers of menthol and glycerol such as menthyl glyceryl ether (menthoxypropanediol); mono-ethers of menthol and glucose such as menthyl glucoside; and mixtures thereof.

The (b) compound may be selected from esters and ethers of menthol, preferably carboxylates and glyceryl ethers, and more preferably menthoxypropanediol.

The amount of the (b) compound(s) in the composition according to the present invention may be 0.001% by weight or more, preferably 0.01% by weight or more, more preferably 0.1% by weight or more, and even more preferably 0.3% by weight or more, relative to the total weight of the composition.

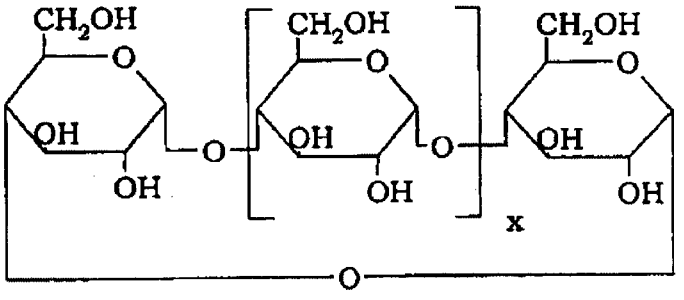
On the other hand, the amount of the (b) compound(s) in the composition according to the present invention may be 20% by weight or less, preferably 10% by weight or less, more preferably 1% by weight or less, and even more preferably 0.7% by weight or less, relative to the total weight of the composition.

The amount of the (b) compound(s) in the composition according to the present invention may range from 0.001% to 20% by weight, preferably from 0.01% to 10% by weight, more preferably from 0.1% to 1% by weight, and even more preferably from 0.3% to 0.7% by weight, relative to the total weight of the composition.

[Cyclodextrin and Derivatives Thereof]

The composition according to the present invention includes at least one (c) compound selected from cyclodextrin and derivatives thereof. If two or more the (c) compounds are used, they may be the same or different.

Any type of cyclodextrins and derivatives thereof can be used as the (c) compound. The cyclodextrin that can be used can be selected from, for example, oligosaccharides of formula:



wherein x is selected from 4 (corresponding to α-cyclodextrin), 5 (corresponding to β-cyclodextrin) and 6 (corresponding to γ-cyclodextrin).

Thus, the (c) compound may be selected from α-cyclodextrin, β-cyclodextrin, γ-cyclodextrin and mixtures thereof.

In one embodiment, the cyclodextrin can be selected from β-cyclodextrin and γ-cyclodextrin, preferably, β-cyclodextrin.

The β-cyclodextrin sold by the company WACKER under the name CAVAMAX W7 PHARMA and the γ-cyclodextrin sold by the company WACKER under the name CAVAMAX W8 can, for example, be used. In another embodiment, the derivatives of cyclodextrin can be selected from, for example, methylcyclodextrins such as the methyl-β-cyclodextrin sold by the company WACKER under the name CAVASOL W7.

The amount of the (c) compound(s) in the composition according to the present invention may be 0.01% by weight or more, preferably 0.1% by weight or more, more preferably 1% by weight or more, and even more preferably 2% by weight or more, relative to the total weight of the composition.

On the other hand, the amount of the (c) compound(s) in the composition according to the present invention may be 30% by weight or less, preferably 20% by weight or less, more preferably 10% by weight or less, and even more preferably 5% by weight or less, relative to the total weight of the composition.

The amount of the (c) compound(s) in the composition according to the present invention may range from 0.01% to 30% by weight, preferably from 0.1% to 20% by weight, more preferably from 1% to 10% by weight, and even more preferably from 2% to 5% by weight, relative to the total weight of the composition.

[Water]

The composition according to the present invention may further include (d) water.

The amount of the (d) water in the composition according to the present invention may be 10% by weight or more, preferably 20% by weight or more, more preferably 30% by weight or more, and even more preferably 40% by weight or more, relative to the total weight of the composition.

On the other hand, the amount of the (d) water in the composition according to the present invention may be 80% by weight or less, preferably 70% by weight or less, more preferably 60% by weight or less, and even more preferably 50% by weight or less, relative to the total weight of the composition.

The amount of the (d) water in the composition according to the present invention may range from 10% to 80% by weight, preferably from 20% to 70% by weight, more preferably from 30% to 60% by weight, and even more preferably from 40% to 50% by weight, relative to the total weight of the composition.

[Oil]

The composition according to the present invention may further comprise at least one (e) oil. If two or more (e) oils are used, they may be the same or different.

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

The (e) 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 (e) 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 animal oils, mention may be made of, for example, squalene and squalane.

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 chosen 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, capryl caprylyl glycerides, glyceryl trimyristate, glyceryl tripalmitate, glyceryl trilinolenate, glyceryl trilaurate, glyceryl tricaprate, glyceryl tricaprylate, glyceryl tri(caprate/caprylate), 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, the silicone oil is chosen from liquid polydialkylsiloxanes, especially liquid polydimethylsiloxanes (PDMS) and liquid polyorganosiloxanes comprising at least one aryl group.

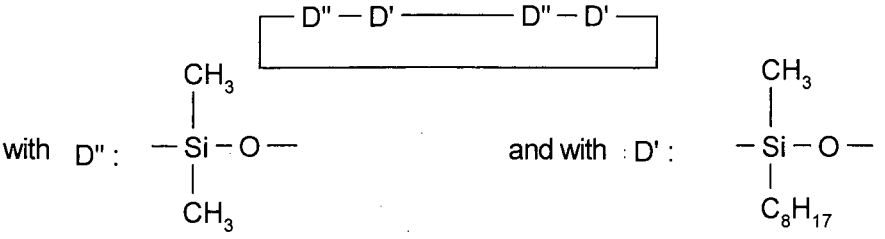
These silicone oils may also be organomodified. The organomodified silicones that can be used in accordance with the present invention are silicone oils as defined above and comprise in their structure one or more organofunctional groups attached via a hydrocarbon-based group.

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 chosen 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:



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; and

(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 chosen from polydialkylsiloxanes, among which mention may be made mainly of polydimethylsiloxanes containing trimethylsilyl end groups.

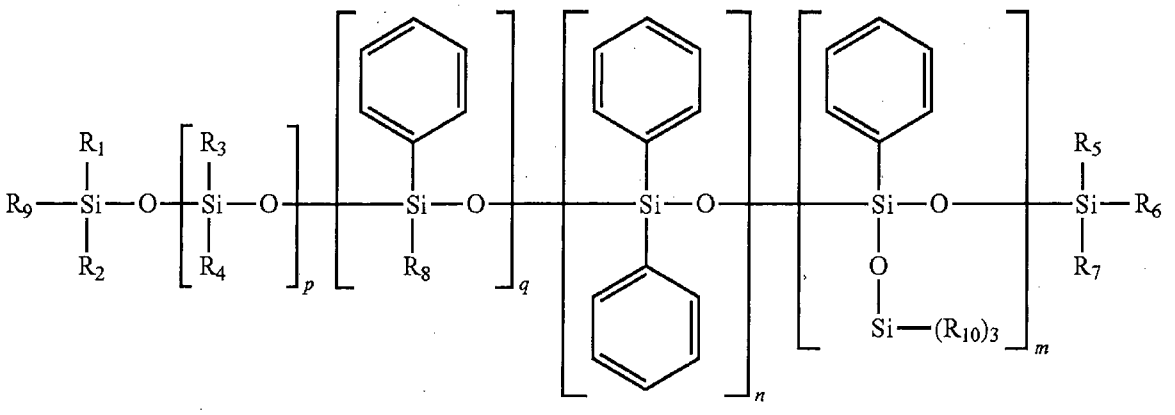
Among these polydialkylsiloxanes, mention may be made, in a non-limiting manner, of the following commercial products:

- 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; and
- 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, mention may be made of polydiarylsiloxanes, especially polydiphenylsiloxanes and polyalkylarylsiloxanes such as phenyl silicone oil.

The phenyl silicone oil may be chosen from the phenyl silicones of the following formula:



in which
R_1 to R_{10}, independently of each other, are saturated or unsaturated, linear, cyclic or branched C_1-C_{30} hydrocarbon-based radicals, preferably C_1-C_{12} hydrocarbon-based radicals, and more preferably C_1-C_6 hydrocarbon-based radicals, in particular methyl, ethyl, propyl, or butyl radicals, and
m, n, p, and q are, independently of each other, integers of 0 to 900 inclusive, preferably 0 to 500 inclusive, and more preferably 0 to 100 inclusive,
with the proviso that the sum n+m+q is other than 0.

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.

As the phenyl silicone oil, phenyl trimethicone (R_1 to R_{10} are methyl; p, q, and n = 0; m=1 in the above formula) is preferable.

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 chosen 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 chosen 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 chosen from C_{12}-C_{20} alkyl and C_{12}-C_{20} alkenyl groups. R may 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 the 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 lauryl alcohol, cetyl alcohol, stearyl alcohol, isostearyl alcohol, behenyl alcohol, undecylenyl alcohol, myristyl alcohol, octyldodecanol, hexyldecanol, and mixtures thereof. In one embodiment, cetyl alcohol, stearyl alcohol, octyldodecanol, hexyldecanol, or a mixture thereof (e.g., cetearyl alcohol) as well as behenyl alcohol, 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 chosen from cetyl alcohol, octyldodecanol, hexyldecanol, and mixtures thereof.

It is preferable that the (e) oil be chosen from hydrocarbon oils, ester oils, silicone oils, and mixtures thereof.

The amount of the (e) oil in the composition according to the present invention may range from 0.01% to 25% by weight, preferably from 0.1% to 20% by weight, more preferably from 1% to 15% by weight, and even more preferably from 5 to 15% by weight, relative to the total weight of the composition.

[UV filter]

The composition of the present invention may comprise at least one UV filter.

There is no limitation to the type of the UV filter. Two or more types of UV filters may be used in the composition of the present invention. Thus, a single type of UV filter or a combination of different types of UV filters may be used.

The UV filter can be selected from inorganic UV filters, organic UV filters, and mixtures thereof.

The composition according to the present invention may comprise the (f) UV filter(s) in an amount ranging from 1% to 30% by weight, preferably ranging from 3% to 25% by weight, more preferably ranging from 5% to 20% by weight, and even more preferably ranging from 7% to 15% by weight, relative to the total weight of the composition.

(Organic UV Filter)

The composition according to the present invention may comprise at least one organic UV filter. If two or more organic UV filters are used, they may be the same or different, preferably the same.

The organic UV filter used for the present invention may be active in the UV-A and/or UV-B region. The organic UV filter may be hydrophilic and/or lipophilic, and preferably lipophilic.

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

The organic UV filter can be selected from the group consisting of anthranilic compounds; dibenzoylmethane compounds; cinnamic compounds; salicylic compounds; camphor compounds; benzophenone compounds; β,β-diphenylacrylate compounds; triazine compounds; benzotriazole compounds; benzalmalonate compounds; benzimidazole compounds; imidazoline compounds; bis-benzoazolyl compounds; p-aminobenzoic acid (PABA) compounds; methylenebis(hydroxyphenylbenzotriazole) compounds; benzoxazole compounds; screening polymers and screening silicones; dimers derived from α-alkylstyrene; 4,4-diarylbutadiene compounds; and mixtures thereof.

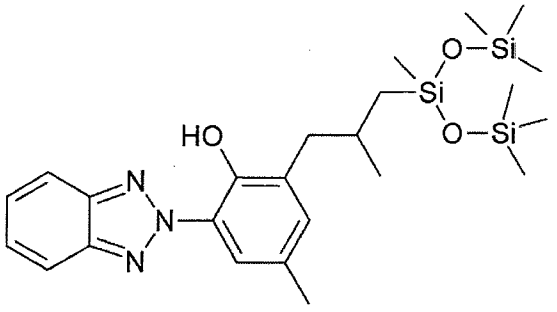
Mention may be made, as examples of the organic UV filter(s), of those denoted below under their INCI names, and mixtures thereof.

- Anthranilic compounds: Menthyl anthranilate, marketed under the trademark "Neo Heliopan MA" by Haarmann and Reimer.
- Dibenzoylmethane compounds: Butyl methoxydibenzoylmethane, marketed in particular under the trademark "Parsol 1789" by Hoffmann-La Roche; and isopropyl dibenzoylmethane.
- Cinnamic compounds: Ethylhexyl methoxycinnamate, marketed in particular under the trademark "Parsol MCX" by Hoffmann-La Roche; isopropyl methoxycinnamate; isopropoxy methoxycinnamate; isoamyl methoxycinnamate, marketed under the trademark "Neo Heliopan E 1000" by Haarmann and Reimer; cinoxate (2-ethoxyethyl-4-methoxy cinnamate); DEA methoxycinnamate; diisopropyl methylcinnamate; and glyceryl ethylhexanoate dimethoxycinnamate.
- Salicylic compounds: Homosalate (homomentyl salicylate), marketed under the trademark "Eusolex HMS" by Rona/EM Industries; ethylhexyl salicylate, marketed under the trademark "Neo Heliopan OS" by Haarmann and Reimer; glycol salicylate; butyloctyl salicylate; phenyl salicylate; dipropyleneglycol salicylate, marketed under the trademark "Dipsal" by Scher; and TEA salicylate, marketed under the trademark "Neo Heliopan TS" by Haarmann and Reimer.
- Camphor compounds, in particular, benzylidenecamphor derivatives: 3-benzylidene camphor, manufactured under the trademark "Mexoryl SD" by Chimex; 4-methylbenzylidene camphor,

marketed under the trademark "Eusolex 6300" by Merck; benzylidene camphor sulfonic acid, manufactured under the trademark "Mexoryl SL" by Chimex; camphor benzalkonium methosulfate, manufactured under the trademark "Mexoryl SO" by Chimex; terephthalylidene dicamphor sulfonic acid, manufactured under the trademark "Mexoryl SX" by Chimex; and polyacrylamidomethyl benzylidene camphor, manufactured under the trademark "Mexoryl SW" by Chimex.

- Benzophenone compounds: Benzophenone-1 (2,4-dihydroxybenzophenone), marketed under the trademark "Uvinul 400" by BASF; benzophenone-2 (Tetrahydroxybenzophenone), marketed under the trademark "Uvinul D50" by BASF; Benzophenone-3 (2-hydroxy-4-methoxybenzophenone) or oxybenzone, marketed under the trademark "Uvinul M40" by BASF; benzophenone-4 (hydroxymethoxy benzophonene sulfonic acid), marketed under the trademark "Uvinul MS40" by BASF; benzophenone-5 (Sodium hydroxymethoxy benzophenone Sulfonate); benzophenone-6 (dihydroxy dimethoxy benzophenone); marketed under the trademark "Helisorb 11" by Norquay; benzophenone-8, marketed under the trademark "Spectra-Sorb UV-24" by American Cyanamid; benzophenone-9 (Disodium dihydroxy dimethoxy benzophenonedisulfonate), marketed under the trademark "Uvinul DS-49" by BASF; benzophenone-12, and n-hexyl 2-(4-diethylamino-2-hydroxybenzoyl)benzoate (UVINUL A+ by BASF).
- β,β-Diphenylacrylate compounds: Octocrylene, marketed in particular under the trademark "Uvinul N539" by BASF; and Etocrylene, marketed in particular under the trademark "Uvinul N35" by BASF.
- Triazine compounds: Diethylhexyl butamido triazone, marketed under the trademark "Uvasorb HEB" by Sigma 3V; 2,4,6-tris(dineopentyl 4'-aminobenzalmalonate)-s-triazine, bis-ethylhexyloxyphenol methoxyphenyl triazine marketed under the trademark «TINOSORB S » by Ciba Geigy, and ethylhexyl triazone marketed under the trademark «UVINUL T150 » by BASF.
- Benzotriazole compounds, in particular, phenylbenzotriazole derivatives: 2-(2H-benzotriazole-2-yl)-6-dodecyl-4-methylpheno, branched and linear; and those described in USP 5240975.
- Benzalmalonate compounds: Dineopentyl 4'-methoxybenzalmalonate, and polyorganosiloxane comprising benzalmalonate functional groups, such as polysilicone-15, marketed under the trademark "Parsol SLX" by Hoffmann-LaRoche.
- Benzimidazole compounds, in particular, phenylbenzimidazole derivatives: Phenylbenzimidazole sulfonic acid, marketed in particular under the trademark "Eusolex 232" by Merck, and disodium phenyl dibenzimidazole tetrasulfonate, marketed under the trademark "Neo Heliopan AP" by Haarmann and Reimer.
- Imidazoline compounds: Ethylhexyl dimethoxybenzylidene dioxoimidazoline propionate.
- Bis-benzoazolyl compounds: The derivatives as described in EP-669,323 and U.S. Pat. No. 2,463,264.
- Para-aminobenzoic acid compounds: PABA (p-aminobenzoic acid), ethyl PABA, Ethyl dihydroxypropyl PABA, pentyl dimethyl PABA, ethylhexyl dimethyl PABA, marketed in particular under the trademark "Escalol 507" by ISP, glyceryl PABA, and PEG-25 PABA, marketed under the trademark "Uvinul P25" by BASF.
- Methylene bis-(hydroxyphenylbenzotriazol) compounds, such as 2,2'-methylenebis[6-(2H-benzotriazol-2-yl)-4-methyl-phenol] marketed in the solid form under the trademark "Mixxim BB/200" by Fairmount Chemical, 2,2'-methylenebis[6-(2H-benzotriazol-2-yl)-4-(1,1,3,3-tetramethylbutyl)phenol] marketed in the micronized form in aqueous dispersion under the trademark "Tinosorb M" by BASF, or under the trademark "Mixxim BB/100" by Fairmount Chemical, and the derivatives as described in U.S. Pat. Nos. 5,237,071 and 5,166,355, GB-2,303,549, DE-197,26,184 and EP-893,119, and

Drometrizole trisiloxane, marketed under the trademark "Silatrizole" by Rhodia Chimie or "Mexoryl XL" by L'Oreal, as represented below.



- Benzoxazole compounds: 2,4-bis[5-1(dimethylpropyl)benzoxazol-2-yl-(4-phenyl)imino]-6-(2-ethylhexyl)imino-1,3,5-
triazine, marketed under the trademark Uvasorb K2A by Sigma 3V.
- Screening polymers and screening silicones: The silicones described in WO 93/04665.
- Dimers derived from α-alkylstyrene: The dimers described in DE-19855649.
- 4,4-Diarylbutadiene compounds: 1,1-dicarboxy(2,2'-dimethylpropyl)-4,4-diphenylbutadiene.

It is preferable that the organic UV filter(s) be selected from the group consisting of:
butyl methoxydibenzoylmethane, ethylhexyl methoxycinnamate, homosalate, ethylhexyl salicylate, octocrylene, phenylbenzimidazole sulfonic acid, benzophenone-3, benzophenone-4, benzophenone-5, n-hexyl 2-(4-diethylamino-2-hydroxybenzoyl)benzoate, 1,1'-(1,4-piperazinediyl)bis[1-[2-[4-(diethylamino)-2-hydroxybenzoyl]phenyl]-methanone 4-methylbenzylidene camphor, terephthalylidene dicamphor sulfonic acid, disodium phenyl dibenzimidazole tetrasulfonate, ethylhexyl triazone, bis-ethylhexyloxyphenol methoxyphenyl triazine, diethylhexyl butamido triazone, 2,4,6-tris(dineopentyl 4'-aminobenzalmalonate)-s-triazine, 2,4,6-tris(diisobutyl 4'-aminobenzalmalonate)-s-triazine, 2,4-bis-(n-butyl 4'-aminobenzalmalonate)-6-[(3-{1,3,3,3-tetramethyl-1-[(trimethylsilyloxy]-disiloxanyl}propyl)amino]-s-triazine, 2,4,6-tris-(di-phenyl)-triazine, 2,4,6-tris-(ter-phenyl)-triazine, methylene bis-benzotriazolyl tetramethylbutylphenol, drometrizole trisiloxane, polysilicone-15, dineopentyl 4'-methoxybenzalmalonate, 1,1-dicarboxy(2,2'-dimethylpropyl)-4,4-diphenylbutadiene, 2,4-bis[5-1 (dimethylpropyl)benzoxazol-2-yl-(4-phenyl)imino]-6-(2-ethylhexyl)imino-1,3,5-triazine, camphor benzylkonium methosulfate, and mixtures thereof.

(Inorganic UV filter)

The composition according to the present invention may comprise an inorganic UV filter. The inorganic UV filter used for the present invention may be active in the UV-A and/or UV-B region.

The inorganic UV filter is generally chosen from metal oxides, preferably titanium, zinc or iron oxides, or mixtures thereof, and more particularly from titanium dioxide (amorphous or crystalline in rutile and/or anatase form), zinc oxide and mixtures thereof. Particularly preferably, the inorganic UV-screening agent is TiO_2.

These metal oxides may be in the form of particles, having a mean elementary size generally of less than 200 nm. Advantageously, the metal oxide particles used have a mean elementary size of less than or equal to 0.15 μm.

These metal oxides may also be in the form of layers, preferably multilayers with a mean thickness generally of less than 0.2 μm.

The inorganic UV filters in accordance with the present invention preferably have a mean elementary particle size of greater than 5 nm and less than 200 nm. According to one particularly preferred embodiment of the present invention, this size preferably ranges from 10 nm to 150 nm.

According to one embodiment of the present invention, the inorganic UV filters may be titanium oxide based nanopigments.

The inorganic UV filters may be coated or uncoated.

The coated inorganic UV filters are pigments that have undergone one or more surface treatments of chemical, electronic, mechanochemical and/or mechanical nature with compounds as described, for example, in Cosmetics & Toiletries, February 1990, Vol. 105, pp. 53-64, such as amino acids, beeswax, fatty acids, fatty alcohols, anionic surfactants, lecithins, sodium, potassium, zinc, iron or aluminium salts of fatty acids, metal alkoxides (titanium or aluminium alkoxides), polyethylene, silicones, proteins (collagen, elastin), alkanolamines, silicon 15 oxides, metal oxides or sodium hexametaphosphate.

Preferably, the inorganic UV filters may be chosen from coated or uncoated titanium dioxide.

[Surfactant]

The composition according to the present invention may further comprise at least one surfactant. Two or more surfactants may be used. Thus, a single type of surfactant or a combination of different types of surfactants may be used.

Any surfactant may be used for the present invention. The surfactant may be selected from the group consisting of anionic surfactants, amphoteric surfactants, cationic surfactants and nonionic surfactants. Two or more surfactants may be used in combination. Thus, a single type of surfactant or a combination of different types of surfactants may be used.

According to one embodiment of the present invention, the amount of the surfactant(s) may range from 0.01 to 20% by weight, preferably from 0.05 to 10% by weight, and more preferably from 0.1 to 5% by weight, relative to the total weight of the composition used in the process according to the present invention.

(i) Anionic Surfactants

The composition may comprise at least one anionic surfactant. Two or more anionic surfactants may be used in combination.

It is preferable that the anionic surfactant be selected from the group consisting of (C_6-C_{30})alkyl sulfates, (C_6-C_{30})alkyl ether sulfates, (C_6-C_{30})alkylamido ether sulfates, alkylaryl polyether sulfates, monoglyceride sulfates; (C_6-C_{30})alkylsulfonates, (C_6-C_{30})alkylamide sulfonates, (C_6-C_{30})alkylaryl sulfonates, α-olefin sulfonates, paraffin sulfonates; (C_6-C_{30})alkyl phosphates; (C_6-C_{30})alkyl sulfosuccinates, (C_6-C_{30})alkyl ether sulfosuccinates, (C_6-C_{30})alkylamide sulfosuccinates; (C_6-C_{30})alkyl sulfoacetates; (C_6-C_{24})acyl sarcosinates; (C_6-C_{24})acyl glutamates; (C_6-C_{30})alkylpolyglycoside carboxylic ethers; (C_6-C_{30})alkylpolyglycoside sulfosuccinates; (C_6-C_{30})alkyl sulfosuccinamates; (C_6-C_{24})acyl isethionates; N-(C_6-C_{24})acyl taurates; C_6-C_{30} fatty acid salts; coconut oil acid salts or hydrogenated coconut oil acid salts; (C_8-C_{20})acyl lactylates; (C_6-C_{30})alkyl-D-galactoside uronic acid salts; polyoxyalkylenated (C_6-C_{30})alkyl ether carboxylic acid salts; polyoxyalkylenated (C_6-C_{30})alkylaryl ether carboxylic acid salts; and polyoxyalkylenated (C_6-C_{30})alkylamido ether carboxylic

acid salts; and corresponding acid forms.

In at least one embodiment, the anionic surfactants are in the form of salts such as salts of alkali metals, for instance sodium; salts of alkaline-earth metals, for instance magnesium; ammonium salts; amine salts; and amino alcohol salts. Depending on the conditions, they may also be in acid form.

It is more preferable that the anionic surfactant be selected from salts of (C_6-C_{30})alkyl sulfate, (C_6-C_{30})alkyl ether sulfates or polyoxyalkylenated (C_6-C_{30})alkyl ether carboxylic acid, salified or not.

(ii) Amphoteric Surfactants

The composition may comprise at least one amphoteric surfactant. Two or more amphoteric surfactants may be used in combination.

The amphoteric or zwitterionic surfactants can be, for example (non-limiting list), amine derivatives such as aliphatic secondary or tertiary amine, and optionally quaternized amine derivatives, in which the aliphatic radical is a linear or branched chain including 8 to 22 carbon atoms and containing at least one water-solubilizing anionic group (for example, carboxylate, sulphonate, sulphate, phosphate or phosphonate).

The amphoteric surfactant may preferably be selected from the group consisting of betaines and amidoaminecarboxylated derivatives.

It is preferable that the amphoteric surfactant be selected from betaine-type surfactants.

The betaine-type amphoteric surfactant is preferably selected from the group consisting of alkylbetaines, alkylamidoalkylbetaines, sulfobetaines, phosphobetaines, and alkylamidoalkylsulfobetaines, in particular, (C_8-C_{24})alkylbetaines, (C_8-C_{24})alkylamido(C_1-C_8)alkylbetaines, sulphobetaines, and (C_8-C_{24})alkylamido(C_1-C_8)alkylsulphobetaines. In one embodiment, the amphoteric surfactants of betaine type are chosen from (C_8-C_{24})alkylbetaines, (C_8-C_{24})alkylamido(C_1-C_8)alkylsulphobetaines, sulphobetaines, and phosphobetaines.

Non-limiting examples that may be mentioned include the compounds classified in the CTFA International Cosmetic Ingredient Dictionary & Handbook, 15th Edition, 2014, under the names cocobetaine, laurylbetaine, cetylbetaine, coco/oleamidopropylbetaine, cocamidopropylbetaine, palmitamidopropylbetaine, stearamidopropylbetaine, cocamidoethylbetaine, cocamidopropylhydroxysultaine, oleamidopropylhydroxysultaine, cocohydroxysultaine, laurylhydroxysultaine, and cocosultaine, alone or as mixtures.

The betaine-type amphoteric surfactant is preferably an alkylbetaine and an alkylamidoalkylbetaine, in particular cocobetaine and cocamidopropylbetaine.

Among the amidoaminecarboxylated derivatives, mention may be made of the products sold under the name Miranol, as described in U.S. Pat. Nos. 2,528,378 and 2,781,354 and classified in the CTFA dictionary, 3rd edition, 1982 (the disclosures of which are incorporated herein by reference), under the names Amphocarboxyglycinates and Amphocarboxypropionates, with the respective structures:

$$R_1\text{-}CONHCH_2CH_2\text{-}N^+(R_2)(R_3)(CH_2COO^-)\ M^+\ X^-\ (B1)$$

in which:

R_1 denotes an alkyl radical of an acid R_1-COOH present in hydrolysed coconut oil, a heptyl, nonyl or undecyl radical,
R_2 denotes a beta-hydroxyethyl group,
R_3 denotes a carboxymethyl group,
M^+ denotes a cationic ion derived from alkaline metals such as sodium; ammonium ion; or an ion derived from an organic amine;
X^- denotes an organic or inorganic anionic ion such as halides, acetates, phosphates, nitrates, alkyl(C_1-C_4)sulfates, alkyl(C_1-C_4)- or alkyl(C_1-C_4)aryl-sulfonates, particularly methylsulfate and ethylsulfate; or M^+ and X^- are not present;

$$R_1'\text{-}CONHCH_2CH_2\text{-}N(B)(C) \quad (B2)$$

in which:
R_1' denotes an alkyl radical of an acid R_1'-COOH present in coconut oil or in hydrolysed linseed oil, an alkyl radical, such as a C_7, C_9, C_{11} or C_{13} alkyl radical, a C_{17} alkyl radical and its iso-form, or an unsaturated C_{17} radical,
B represents -CH_2CH_2OX',
C represents -$(CH_2)_z$-Y', with z=1 or 2,
X' denotes a -CH_2-COOH group, -CH_2-COOZ', -CH_2CH_2-COOH, -CH_2CH_2-COOZ' or a hydrogen atom, and
Y' denotes -COOH, -COOZ', -CH_2-CHOH-SO_3Z', -CH_2-CHOH-SO_3H radical or a -CH_2-CH(OH)-SO_3-Z' radical,
wherein Z' represents an ion of an alkaline or alkaline earth metal such as sodium, an ion derived from an organic amine or an ammonium ion;
and

$$R_{a''}\text{-}NH\text{-}CH(Y'')\text{-}(CH_2)_n\text{-}C(O)\text{-}NH\text{-}(CH_2)_{n'}\text{-}N(Rd)(Re) \quad (B'2)$$

in which:
Y" denotes -C(O)OH, -C(O)OZ", -CH_2-CH(OH)-SO_3H or -CH_2-CH(OH)-SO_3-Z", wherein Z" denotes a cationic ion derived from alkaline metal or alkaline-earth metals such as sodium, an ion derived from organic amine or an ammonium ion;
Rd and Re denote a C_1-C_4 alkyl or C_1-C_4 hydroxyalkyl radical;
$R_{a''}$ denotes a C_{10}-C_{30} group alkyl or alkenyl group from an acid, and
n and n' independently denote an integer from 1 to 3.

It is preferable that the amphoteric surfactant with formula B1 and B2 be selected from (C_8-C_{24})-alkyl amphomonoacetates, (C_8-C_{24})alkyl amphodiacetates, (C_8-C_{24})alkyl amphomonopropionates, and (C_8-C_{24})alkyl amphodipropionates

These compounds are classified in the CTFA dictionary, 5th edition, 1993, under the names Disodium Cocoamphodiacetate, Disodium Lauroamphodiacetate, Disodium Caprylamphodiacetate, Disodium Capryloamphodiacetate, Disodium Cocoamphodipropionate, Disodium Lauroamphopropionate, Disodium Caprylamphodipropionate, Disodium Caprylamphodipropionate, Lauroamphodipropionic acid and Cocoamphodipropionic acid.

By way of example, mention may be made of the cocoamphodiacetate sold under the trade name Miranol® C2M concentrate by the company Rhodia Chimie.

Among compounds of formula (B'2), mention may be made of sodium diethylaminopropyl

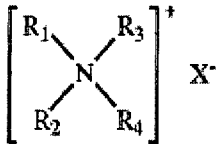
cocoaspartamide (CTFA) marketed by CHIMEX under the denomination CHIMEXANE HB.

(iii) Cationic Surfactants

The composition may comprise at least one cationic surfactant. Two or more cationic surfactants may be used in combination.

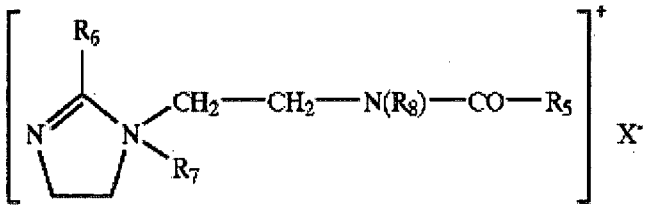
The cationic surfactant may be selected from the group consisting of optionally polyoxyalkylenated, primary, secondary or tertiary fatty amine salts, quaternary ammonium salts, and mixtures thereof.

Examples of quaternary ammonium salts that may be mentioned include, but are not limited to:
those of general formula (B3) below:



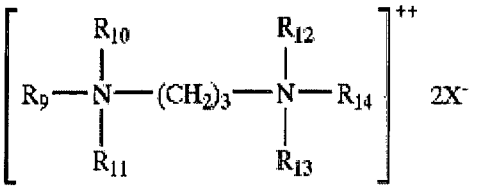
(B3)

wherein
R_1, R_2, R_3, and R_4, which may be identical or different, are chosen from linear and branched aliphatic radicals including from 1 to 30 carbon atoms and optionally including heteroatoms such as oxygen, nitrogen, sulfur and halogens. The aliphatic radicals may be chosen, for example, from alkyl, alkoxy, C_2-C_6 polyoxyalkylene, alkylamide, (C_{12}-C_{22})alkylamido(C_2-C_6)alkyl, (C_{12}-C_{22})alkylacetate and hydroxyalkyl radicals; and aromatic radicals such as aryl and alkylaryl; and X^- is chosen from halides, phosphates, acetates, lactates, (C_2-C_6) alkyl sulfates and alkyl- or alkylaryl-sulfonates;
quaternary ammonium salts of imidazoline, for instance those of formula (B4) below:



(B4)

wherein:
R_5 is chosen from alkenyl and alkyl radicals including from 8 to 30 carbon atoms, for example fatty acid derivatives of tallow or of coconut;
R_6 is chosen from hydrogen, C_1-C_4 alkyl radicals, and alkenyl and alkyl radicals including from 8 to 30 carbon atoms;
R_7 is chosen from C_1-C_4 alkyl radicals;
R_8 is chosen from hydrogen and C_1-C_4 alkyl radicals; and
X^- is chosen from halides, phosphates, acetates, lactates, alkyl sulfates, alkyl sulfonates, and alkylaryl sulfonates. In one embodiment, R_5 and R_6 are, for example, a mixture of radicals chosen from alkenyl and alkyl radicals including from 12 to 21 carbon atoms, such as fatty acid derivatives of tallow, R_7 is methyl and R_8 is hydrogen. Examples of such products include, but are not limited to, Quaternium-27 (CTFA 1997) and Quaternium-83 (CTFA 1997), which are sold under the names "Rewoquat®" W75, W90, W75PG and W75HPG by the company Witco;
di or tri quaternary ammonium salts of formula (B5):



(B5)

wherein:

R_9 is chosen from aliphatic radicals including from 16 to 30 carbon atoms;

R_{10} is chosen from hydrogen or alkyl radicals including from 1 to 4 carbon atoms or the group $-(CH_2)_3(R_{16a})(R_{17a})(R_{18a})N^+X^-$;

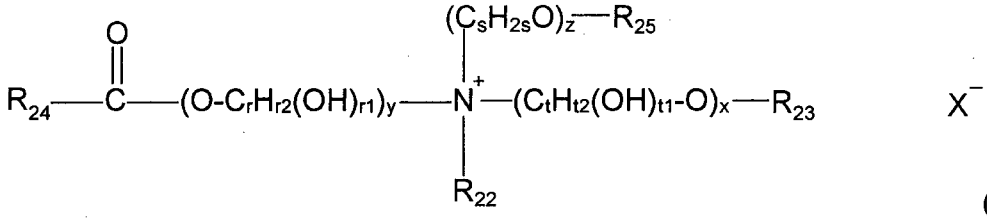
R_{11}, R_{12}, R_{13}, R_{14}, R_{16a}, R_{17a}, and R_{18a}, which may be identical or different, are chosen from hydrogen and alkyl radicals including from 1 to 4 carbon atoms; and

X^- is chosen from halides, acetates, phosphates, nitrates, ethyl sulfates, and methyl sulfates.

An example of one such diquaternary ammonium salt is FINQUAT CT-P of FINETEX (Quaternium-89) or FINQUAT CT (Quaternium-75);

and

quaternary ammonium salts including at least one ester function, such as those of formula (B6) below:



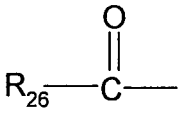
(B6)

wherein:

R_{22} is chosen from C_1-C_6 alkyl radicals and C_1-C_6 hydroxyalkyl and dihydroxyalkyl radicals;

R_{23} is chosen from:

the radical below:

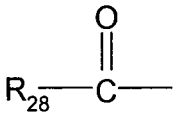


,

linear and branched, saturated and unsaturated C_1-C_{22} hydrocarbon-based radicals R_{27}, and hydrogen,

R_{25} is chosen from:

the radical below:



,

linear and branched, saturated and unsaturated C_1-C_6 hydrocarbon-based radicals R_{29}, and hydrogen,

R_{24}, R_{26}, and R_{28}, which may be identical or different, are chosen from linear and branched, saturated and unsaturated, C_7-C_{21}, hydrocarbon-based radicals;

r, s, and t, which may be identical or different, are chosen from integers ranging from 2 to 6;

each of r1 and t1, which may be identical or different, is 0 or 1, and r2+r1=2r and t1+2t=2t;

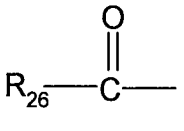
y is chosen from integers ranging from 1 to 10;

x and z, which may be identical or different, are chosen from integers ranging from 0 to 10;

X^- is chosen from simple and complex, organic and inorganic anions; with the proviso that the sum x+y+z ranges from 1 to 15, that when x is 0, R_{23} denotes R_{27}, and that when z is 0, R_{25} denotes R_{29}. R_{22}

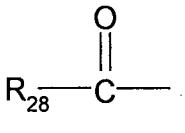
may be chosen from linear and branched alkyl radicals. In one embodiment, R_{22} is chosen from linear alkyl radicals. In another embodiment, R_{22} is chosen from methyl, ethyl, hydroxyethyl, and dihydroxypropyl radicals, for example methyl and ethyl radicals. In one embodiment, the sum x+y+z ranges from 1 to 10. When R_{23} is a hydrocarbon-based radical R_{27}, it may be long and include from 12 to 22 carbon atoms, or short and include from 1 to 3 carbon atoms. When R_{25} is a hydrocarbon-based radical R_{29}, it may include, for example, from 1 to 3 carbon atoms. By way of a non-limiting example, in one embodiment, R_{24}, R_{26}, and R_{28}, which may be identical or different, are chosen from linear and branched, saturated and unsaturated, C_{11}-C_{21} hydrocarbon-based radicals, for example from linear and branched, saturated and unsaturated C_{11}-C_{21} alkyl and alkenyl radicals. In another embodiment, x and z, which may be identical or different, are 0 or 1. In one embodiment, y is equal to 1. In another embodiment, r, s and t, which may be identical or different, are equal to 2 or 3, for example equal to 2. The anion X^- may be chosen from, for example, halides, such as chloride, bromide, and iodide; and C_1-C_4 alkyl sulfates, such as methyl sulfate. However, methanesulfonate, phosphate, nitrate, tosylate, an anion derived from an organic acid, such as acetate and lactate, and any other anion that is compatible with the ammonium including an ester function, are other non-limiting examples of anions that may be used according to the present invention. In one embodiment, the anion X^- is chosen from chloride and methyl sulfate.

In another embodiment, the ammonium salts of formula (B6) may be used, wherein:
R_{22} is chosen from methyl and ethyl radicals,
x and y are equal to 1;
z is equal to 0 or 1;
r, s and t are equal to 2;
R_{23} is chosen from:
the radical below:



,

methyl, ethyl, and C_{14}-C_{22} hydrocarbon-based radicals, hydrogen;
R_{25} is chosen from:
the radical below:



,

and hydrogen;
R_{24}, R_{26}, and R_{28}, which may be identical or different, are chosen from linear and branched, saturated and unsaturated, C_{13}-C_{17} hydrocarbon-based radicals, for example from linear and branched, saturated and unsaturated, C_{13}-C_{17} alkyl and alkenyl radicals.

In one embodiment, the hydrocarbon-based radicals are linear.

Non-limiting examples of compounds of formula (B6) that may be mentioned include salts, for example chloride and methyl sulfate, of diacyloxyethyl-dimethylammonium, of diacyloxyethyl-hydroxyethyl-methylammonium, of monoacyloxyethyl-dihydroxyethyl-methylammonium, of triacyloxyethyl-methylammonium, of monoacyloxyethyl-hydroxyethyl-dimethyl-ammonium, and mixtures thereof. In one embodiment, the acyl radicals may include from 14 to 18 carbon atoms, and may be derived, for example, from a plant oil, for instance palm oil and sunflower oil. When the

compound includes several acyl radicals, these radicals may be identical or different.

These products may be obtained, for example, by direct esterification of optionally oxyalkylenated triethanolamine, triisopropanolamine, alkyldiethanolamine or alkyldiisopropanolamine onto fatty acids or onto mixtures of fatty acids of plant or animal origin, or by transesterification of the methyl esters thereof. This esterification may be followed by a quaternization using an alkylating agent chosen from alkyl halides, for example methyl and ethyl halides; dialkyl sulfates, for example dimethyl and diethyl sulfates; methyl methanesulfonate; methyl para-toluenesulfonate; glycol chlorohydrin; and glycerol chlorohydrin.

Such compounds are sold, for example, under the names Dehyquart® by the company Cognis, Stepanquat® by the company Stepan, Noxamium® by the company Ceca, and "Rewoquat® WE 18" by the company Rewo-Goldschmidt.

Other non-limiting examples of ammonium salts that may be used in the composition according to the present invention include the ammonium salts including at least one ester function described in U.S. Pat. Nos. 4,874,554 and 4,137,180.

Among the quaternary ammonium salts mentioned above that may be used in the composition according to the present invention include, but are not limited to, those corresponding to formula (I), for example tetraalkylammonium chlorides, for instance dialkyldimethylammonium and alkyltrimethylammonium chlorides in which the alkyl radical includes from about 12 to 22 carbon atoms, such as behenyltrimethylammonium, distearyldimethylammonium, cetyltrimethylammonium and benzyldimethylstearylammonium chloride; palmitylamidopropyltrimethylammonium chloride; and stearamidopropyldimethyl(myristyl acetate)ammonium chloride, sold under the name "Ceraphyl® 70" by the company Van Dyk.

According to one embodiment, the cationic surfactant that may be used in the composition according to the present invention is chosen from behenyltrimethylammonium chloride, cetyltrimethylammonium chloride, Quaternium-83, Quaternium-87, Quaternium-22, behenylamidopropyl-2,3-dihydroxypropyldimethylammonium chloride, palmitylamidopropyltrimethylammonium chloride, and stearamidopropyldimethylamine.

(iv) Nonionic Surfactants

The composition comprises at least one nonionic surfactant. Two or more nonionic surfactants may be used in combination.

The nonionic surfactants are compounds well known in themselves (see, e.g., in this regard, "Handbook of Surfactants" by M. R. Porter, Blackie & Son publishers (Glasgow and London), 1991, pp. 116-178). Thus, they can, for example, be chosen from alcohols, alpha-diols, alkylphenols and esters of fatty acids, these compounds being ethoxylated, propoxylated or glycerolated and having at least one fatty chain comprising, for example, from 8 to 30 carbon atoms, it being possible for the number of ethylene oxide or propylene oxide groups to range from 2 to 50, and for the number of glycerol groups to range from 1 to 30. Maltose derivatives may also be mentioned. Non-limiting mention may also be made of copolymers of ethylene oxide and/or of propylene oxide; condensates of ethylene oxide and/or of propylene oxide with fatty alcohols; polyethoxylated fatty amides comprising, for example, from 2 to 30 mol of ethylene oxide; polyglycerolated fatty amides comprising, for example, from 1.5 to 5 glycerol groups, such as from 1.5 to 4; ethoxylated fatty acid esters of sorbitan comprising from 2 to 30 mol of ethylene oxide; ethoxylated oils of plant origin; fatty acid esters of

sucrose; fatty acid esters of polyethylene glycol; polyethoxylated fatty acid mono or diesters of glycerol (C_6-C_{24})alkylpolyglycosides; N-(C_6-C_{24})alkylglucamine derivatives; amine oxides such as (C_{10}-C_{14})alkylamine oxides or N-(C_{10}-C_{14})acylaminopropylmorpholine oxides; silicone surfactants; and mixtures thereof.

The nonionic surfactants may preferably be chosen from monooxyalkylenated, polyoxyalkylenated, monoglycerolated or polyglycerolated nonionic surfactants. The oxyalkylene units are more particularly oxyethylene or oxypropylene units, or a combination thereof, and are preferably oxyethylene units.

Examples of monooxyalkylenated or polyoxyalkylenated nonionic surfactants that may be mentioned include:
monooxyalkylenated or polyoxyalkylenated (C_8-C_{24})alkylphenols,
saturated or unsaturated, linear or branched, monooxyalkylenated or polyoxyalkylenated C_8-C_{30} alcohols,
saturated or unsaturated, linear or branched, monooxyalkylenated or polyoxyalkylenated C_8-C_{30} amides,
esters of saturated or unsaturated, linear or branched, C_8-C_{30} acids and of polyalkylene glycols,
monooxyalkylenated or polyoxyalkylenated esters of saturated or unsaturated, linear or branched, C_8-C_{30} acids and of sorbitol,
saturated or unsaturated, monooxyalkylenated or polyoxyalkylenated plant oils,
condensates of ethylene oxide and/or of propylene oxide, inter alia, alone or as mixtures.

The surfactants preferably contain a number of moles of ethylene oxide and/or of propylene oxide of between 1 and 100 and most preferably between 2 and 50. According to one of the embodiments of the present invention, the polyoxyalkylenated nonionic surfactants are chosen from polyoxyethylenated fatty alcohol (polyethylene glycol ether of fatty alcohol) and polyoxyethylenated fatty ester (polyethylene glycol ester of fatty acid).

Examples of polyoxyethylenated saturated fatty alcohol (or C_8-C_{30} alcohols) that may be mentioned include the adducts of ethylene oxide with lauryl alcohol, especially those containing from 9 to 50 oxyethylene units and more particularly those containing from 10 to 12 oxyethylene units (Laureth-10 to Laureth-12, as the CTFA names); the adducts of ethylene oxide with behenyl alcohol, especially those containing from 9 to 50 oxyethylene units (Beheneth-9 to Beheneth-50, as the CTFA names); the adducts of ethylene oxide with cetearyl alcohol (mixture of cetyl alcohol and stearyl alcohol), especially those containing from 10 to 30 oxyethylene units (Ceteareth-10 to Ceteareth-30, as the CTFA names); the adducts of ethylene oxide with cetyl alcohol, especially those containing from 10 to 30 oxyethylene units (Ceteth-10 to Ceteth-30, as the CTFA names); the adducts of ethylene oxide with stearyl alcohol, especially those containing from 10 to 30 oxyethylene units (Steareth-10 to Steareth-30, as the CTFA names); the adducts of ethylene oxide with isostearyl alcohol, especially those containing from 10 to 50 oxyethylene units (Isosteareth-10 to Isosteareth-50, as the CTFA names); and mixtures thereof.

Examples of polyoxyethylenated unsaturated fatty alcohol (or C_8-C_{30} alcohols) that may be mentioned include the adducts of ethylene oxide with oleyl alcohol, especially those containing from 2 to 50 oxyethylene units and more particularly those containing from 10 to 40 oxyethylene units (Oleth-10 to Oleth-40, as the CTFA names); and mixture thereof.

As examples of monoglycerolated or polyglycerolated nonionic surfactants, monoglycerolated or polyglycerolated C_8-C_{40} alcohols are preferably used.

In particular, the monoglycerolated or polyglycerolated C_8-C_{40} alcohols correspond to the following formula:

$$RO\text{-}[CH_2\text{-}CH(CH_2OH)\text{-}O]_m\text{-}H \text{ or } RO\text{-}[CH(CH_2OH)\text{-}CH_2O]_m\text{-}H$$

in which R represents a linear or branched C_8-C_{40} and preferably C_8-C_{30} alkyl or alkenyl radical, and m represents a number ranging from 1 to 30 and preferably from 1.5 to 10.

As examples of compounds that are suitable in the context of the present invention, mention may be made of lauryl alcohol containing 4 mol of glycerol (INCI name: Polyglyceryl-4 Lauryl Ether), lauryl alcohol containing 1.5 mol of glycerol, oleyl alcohol containing 4 mol of glycerol (INCI name: Polyglyceryl-4 Oleyl Ether), oleyl alcohol containing 2 mol of glycerol (INCI name: Polyglyceryl-2 Oleyl Ether), cetearyl alcohol containing 2 mol of glycerol, cetearyl alcohol containing 6 mol of glycerol, oleocetyl alcohol containing 6 mol of glycerol, and octadecanol containing 6 mol of glycerol.

The alcohol may represent a mixture of alcohols in the same way that the value of m represents a statistical value, which means that, in a commercial product, several species of polyglycerolated fatty alcohol may coexist in the form of a mixture.

Among the monoglycerolated or polyglycerolated alcohols, it is preferable to use the C_8/C_{10} alcohol containing 1 mol of glycerol, the C_{10}/C_{12} alcohol containing 1 mol of glycerol and the C_{12} alcohol containing 1.5 mol of glycerol.

The monoglycerolated or polyglycerolated C_8-C_{40} fatty esters may correspond to the following formula:

$$R'O\text{-}[CH_2\text{-}CH(CH_2OR'')\text{-}O]_m\text{-}R''' \text{ or } R'O\text{-}[CH(CH_2OR'')\text{-}CH_2O]_m\text{-}R'''$$

in which each of R', R" and R"' independently represents a hydrogen atom, or a linear or branched C_8-C_{40} and preferably C_8-C_{30} alkyl-CO- or alkenyl-CO-radical, with the proviso that at least one of R', R" and R"' is not a hydrogen atom, and m represents a number ranging from 1 to 30 and preferably from 1.5 to 10.

Examples of polyoxyethylenated fatty esters that may be mentioned include the adducts of ethylene oxide with esters of lauric acid, palmitic acid, stearic acid or behenic acid, and mixtures thereof, especially those containing from 9 to 100 oxyethylene units, such as PEG-9 to PEG-50 laurate (CTFA names: PEG-9 laurate to PEG-50 laurate); PEG-9 to PEG-50 palmitate (CTFA names: PEG-9 palmitate to PEG-50 palmitate); PEG-9 to PEG-50 stearate (CTFA names: PEG-9 stearate to PEG-50 stearate); PEG-9 to PEG-50 palmitostearate; PEG-9 to PEG-50 behenate (CTFA names: PEG-9 behenate to PEG-50 behenate); polyethylene glycol 100 EO monostearate (CTFA name: PEG-100 stearate); and mixtures thereof.

According to one of the embodiments of the present invention, the nonionic surfactant may be selected from esters of polyols with fatty acids with a saturated or unsaturated chain containing for example from 8 to 24 carbon atoms, preferably 12 to 22 carbon atoms, and polyoxyalkylenated derivatives thereof, preferably containing from 10 to 200, and more preferably from 10 to 100 oxyalkylene units, such as glyceryl esters of a C_8-C_{24}, preferably C_{12}-C_{22}, fatty acid or acids and polyoxyalkylenated derivatives thereof, preferably containing from 10 to 200, and more preferably from 10 to 100 oxyalkylene units; sorbitol esters of a C_8-C_{24}, preferably C_{12}-C_{22}, fatty acid or acids and

polyoxyalkylenated derivatives thereof, preferably containing from 10 to 200, and more preferably from 10 to 100 oxyalkylene units; sugar (sucrose, maltose, glucose, fructose, and/or alkylglycose) esters of a C_8-C_{24}, preferably C_{12}-C_{22}, fatty acid or acids and polyoxyalkylenated derivatives thereof, preferably containing from 10 to 200, and more preferably from 10 to 100 oxyalkylene units; ethers of fatty alcohols; ethers of sugar and a C_8-C_{24}, preferably C_{12}-C_{22}, fatty alcohol or alcohols; and mixtures thereof.

As glyceryl esters of fatty acids, glyceryl stearate (glyceryl mono-, di- and/or tristearate) (CTFA name: glyceryl stearate), glyceryl laurate or glyceryl ricinoleate and mixtures thereof can be cited, and as polyoxyalkylenated derivatives thereof, mono-, di- or triester of fatty acids with a polyoxyalkylenated glycerol (mono-, di- or triester of fatty acids with a polyalkylene glycol ether of glycerol), preferably polyoxyethylenated glyceryl stearate (mono-, di- and/or tristearate), such as PEG-20 glyceryl stearate (mono-, di- and/or tristearate) can be cited.

Mixtures of these surfactants, such as for example the product containing glyceryl stearate and PEG-100 stearate, marketed under the name ARLACEL 165 by Uniqema, and the product containing glyceryl stearate (glyceryl mono- and distearate) and potassium stearate marketed under the name TEGIN by Goldschmidt (CTFA name: glyceryl stearate SE), can also be used.

The sorbitol esters of C_8-C_{24} fatty acids and polyoxyalkylenated derivatives thereof can be selected from sorbitan palmitate, sorbitan isostearate, sorbitan trioleate and esters of fatty acids and alkoxylated sorbitan containing for example from 20 to 100 EO, such as for example sorbitan monostearate (CTFA name: sorbitan stearate), sold by the company ICI under the name Span 60, sorbitan monopalmitate (CTFA name: sorbitan palmitate), sold by the company ICI under the name Span 40, and sorbitan tristearate 20 EO (CTFA name: polysorbate 65), sold by the company ICI under the name Tween 65, polyethylene sorbitan trioleate (polysorbate 85) or the compounds marketed under the trade names Tween 20 or Tween 60 by Uniqema.

As esters of fatty acids and glucose or alkylglucose, glucose palmitate, alkylglucose sesquistearates such as methylglucose sesquistearate, alkylglucose palmitates such as methylglucose or ethylglucose palmitate, methylglucoside fatty esters, the diester of methylglucoside and oleic acid (CTFA name: Methyl glucose dioleate), the mixed ester of methylglucoside and the mixture of oleic acid/hydroxystearic acid (CTFA name: Methyl glucose dioleate/hydroxystearate), the ester of methylglucoside and isostearic acid (CTFA name: Methyl glucose isostearate), the ester of methylglucoside and lauric acid (CTFA name: Methyl glucose laurate), the mixture of monoester and diester of methylglucoside and isostearic acid (CTFA name: Methyl glucose sesqui-isostearate), the mixture of monoester and diester of methylglucoside and stearic acid (CTFA name: Methyl glucose sesquistearate) and in particular the product marketed under the name Glucate SS by AMERCHOL, and mixtures thereof can be cited.

As ethoxylated ethers of fatty acids and glucose or alkylglucose, ethoxylated ethers of fatty acids and methylglucose, and in particular the polyethylene glycol ether of the diester of methylglucose and stearic acid with about 20 moles of ethylene oxide (CTFA name: PEG-20 methyl glucose distearate) such as the product marketed under the name Glucam E-20 distearate by AMERCHOL, the polyethylene glycol ether of the mixture of monoester and diester of methyl-glucose and stearic acid with about 20 moles of ethylene oxide (CTFA name: PEG-20 methyl glucose sesquistearate) and in particular the product marketed under the name Glucamate SSE-20 by AMERCHOL and that marketed under the name Grillocose PSE-20 by GOLDSCHMIDT, and mixtures thereof, can for example be cited.

As sucrose esters, saccharose palmito-stearate, saccharose stearate and saccharose monolaurate can for example be cited.

As sugar ethers, alkylpolyglucosides can be used, and for example decylglucoside such as the product marketed under the name MYDOL 10 by Kao Chemicals, the product marketed under the name PLANTAREN 2000 by Henkel, and the product marketed under the name ORAMIX NS 10 by Seppic, caprylyl/capryl glucoside such as the product marketed under the name ORAMIX CG 110 by Seppic or under the name LUTENSOL GD 70 by BASF, laurylglucoside such as the products marketed under the names PLANTAREN 1200 N and PLANTACARE 1200 by Henkel, coco-glucoside such as the product marketed under the name PLANTACARE 818/UP by Henkel, cetostearyl glucoside possibly mixed with cetostearyl alcohol, marketed for example under the name MONTANOV 68 by Seppic, under the name TEGO-CARE CG90 by Goldschmidt and under the name EMULGADE KE3302 by Henkel, arachidyl glucoside, for example in the form of the mixture of arachidyl and behenyl alcohols and arachidyl glucoside marketed under the name MONTANOV 202 by Seppic, cocoylethylglucoside, for example in the form of the mixture (35/65) with cetyl and stearyl alcohols, marketed under the name MONTANOV 82 by Seppic, and mixtures thereof can in particular be cited.

Mixtures of glycerides of alkoxylated plant oils such as mixtures of ethoxylated (200 EO) palm and copra (7 EO) glycerides can also be cited.

The nonionic surfactant according to the present invention preferably contains alkenyl or a branched C_{12}-C_{22} acyl chain such as an oleyl or isostearyl group. More preferably, the nonionic surfactant according to the present invention is PEG-20 glyceryl triisostearate.

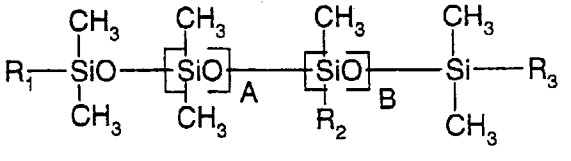
According to one of the embodiments of the present invention, the nonionic surfactant may be selected from copolymers of ethylene oxide and of propylene oxide, in particular copolymers of the following formula:

$$HO(C_2H_4O)_a(C_3H_6O)_b(C_2H_4O)_cH$$

in which a, b and c are integers such that a+c ranges from 2 to 100 and b ranges from 14 to 60, and mixtures thereof.

According to one of the embodiments of the present invention, the nonionic surfactant may be selected from silicone surfactants. Non-limiting mention may be made of those disclosed in documents US-A-5364633 and US-A-5411744.

The silicone surfactant may preferably be a compound of formula (I):



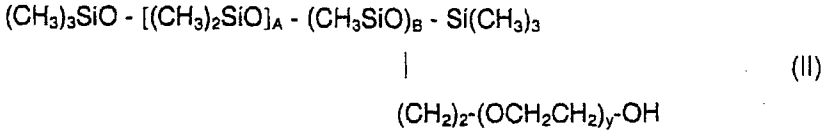
(I)

in which:
R_1, R_2 and R_3, independently of each other, represent a C_1-C_6 alkyl radical or a radical $-(CH_2)_x-(OCH_2CH_2)_y-(OCH_2CH_2CH_2)_z-OR_4$, at least one radical R_1, R_2 or R_3 not being an alkyl radical; R_4 being a hydrogen, an alkyl radical or an acyl radical;

A is an integer ranging from 0 to 200;
B is an integer ranging from 0 to 50; with the proviso that A and B are not simultaneously equal to zero;
x is an integer ranging from 1 to 6;
y is an integer ranging from 1 to 30;
z is an integer ranging from 0 to 5.

According to one preferred embodiment of the present invention, in the compound of formula (I), the alkyl radical is a methyl radical, x is an integer ranging from 2 to 6 and y is an integer ranging from 4 to 30.

As examples of silicone surfactants of formula (I), mention may be made of the compounds of formula (II):



(II)

in which A is an integer ranging from 20 to 105, B is an integer ranging from 2 to 10 and y is an integer ranging from 10 to 20.

As examples of silicone surfactants of formula (I), mention may also be made of the compounds of formula (III):

(III)

in which A' and y are integers ranging from 10 to 20.

Compounds of the present invention which may be used are those sold by the company Dow Corning under the names DC 5329, DC 7439-146, DC 2-5695 and Q4-3667. The compounds DC 5329, DC 7439-146 and DC 2-5695 are compounds of formula (II) in which, respectively, A is 22, B is 2 and y is 12; A is 103, B is 10 and y is 12; A is 27, B is 3 and y is 12.

The compound Q4-3667 is a compound of formula (III) in which A is 15 and y is 13.

[Other Ingredients]

The composition according to the present invention may also include at least one optional or additional ingredient.

The optional or additional ingredient(s) may be selected from the group consisting of anionic, cationic, nonionic, or amphoteric polymers; thickeners; inorganic UV filters; peptides and derivatives thereof; protein hydrolyzates; swelling agents and penetrating agents; agents for combating hair loss; anti-dandruff agents; natural or synthetic thickeners for oils; suspending agents; sequestering agents; opacifying agents; dyes; vitamins or provitamins; fragrances; preserving agents, stabilizers; and mixtures thereof.

The composition according to the present invention may include one or several cosmetically acceptable organic solvents, which may be alcohols: in particular monovalent alcohols such as ethyl alcohol, isopropyl alcohol, benzyl alcohol, and phenylethyl alcohol; diols such as ethylene glycol,

propylene glycol, and butylene glycol; other polyols such as glycerol, sugar, and βs; and ethers such as ethylene glycol monomethyl, monoethyl, and monobutyl ethers, propylene glycol monomethyl, monoethyl, and monobutyl ether, and butylene glycol monomethyl, monoethyl, and monobutyl ethers.

The organic solvent(s) may then be present in a concentration of from 0.01% to 20% by weight, preferably from 0.1% to 10% by weight, and more preferably from 1% to 5% by weight, relative to the total weight of the composition.

[Form]

The form of the composition according to the present invention is not particularly limited, and may take various forms such as a W/O emulsion, an O/W emulsion, an aqueous gel, an aqueous solution, or the like. It is preferable that the composition according to the present invention be in the form of an emulsion, and more preferably in the form of an O/W emulsion.

[Preparation]

The composition according to the present invention can be prepared by mixing the above-described essential and optional ingredients in a conventional manner.

[Cosmetic Process and Use]

The composition according to the present invention may preferably be used as a cosmetic composition. The cosmetic composition may be any of skin cosmetics, hair cosmetics, makeup cosmetics, and cosmetics for use on mucosa such as lips, and the like, and is preferably a skin cosmetic.

In particular, the composition according to the present invention may be intended for application onto a keratin substance such as the skin, scalp, and/or lips, preferably the skin. Thus, the composition according to the present invention can be used for a cosmetic process for the skin.

Since the composition according to the present invention includes the ingredients (a), (b) and (c), it can provide cooling effects.

The cosmetic process or cosmetic use for a keratin substance such as the skin, according to the present invention comprises, at least, the step of applying onto the keratin substance the composition according to the present invention.

In one embodiment, the present invention relates to a process for providing long-lasting cooling or re-cooling effects on a keratin substance such as the skin, comprising at least, the step of applying onto the keratin substance the composition according to the present invention.

In one embodiment, the present invention relates to a process for providing sufficient immediate cooling, long-lasting cooling and re-cooling effects on a keratin substance such as the skin, comprising at least, the step of applying onto the keratin substance the composition according to the present invention.

The present invention also relates to a use of a combination of

(a) at least one endothermic substance,

(b) at least one compound selected from menthol and derivatives thereof, and

(c) at least one compound selected from cyclodextrin and derivatives thereof

in a composition in order to make the composition capable of providing long-lasting cooling or re-cooling effects, preferably sufficient immediate cooling, long-lasting cooling, and re-cooling effects.

The cooling effects provided by the composition according to the present invention can be, preferably synergistically, enhanced or improved in consideration of all the immediate cooling, long lasting cooling and re-cooling effects as compared to those provided by a composition in which any one of the ingredients (a), (b) and (c) is not included.

EXAMPLES

The present invention will be described in a more detailed manner by way of examples. However, these examples should not be construed as limiting the scope of the present invention. The examples below are presented as non-limiting illustrations in the field of the present invention.

[Example 1 and Comparative Examples 1-3]

The following compositions according to Example 1 and Comparative Examples 1-3, shown in Table 1, were prepared by mixing the ingredients shown in Table 1 at room temperature. The numerical values for the amounts of the ingredients shown in Table 1 are all based on "% by weight" as active raw materials.

Table 1

	Ex. 1	Comp. Ex. 1	Comp. Ex. 2	Comp. Ex. 3
Water	qsp100	qsp100	qsp100	qsp100
Menthoxypropanediol	0.5	-	0.5	0.5
Cyclodextrin	2.46	2.46	-	2.46
Xylitol	3	3	3	-
Phenoxyethanol	0.5	0.5	0.5	0.5
Trisodium Ethylenediamine Disuccinate	0.1	0.1	0.1	0.1
Propanediol	2	2	2	2
Inulin Lauryl Carbamate	0.3	0.3	0.3	0.3
Sodium Stearoyl Glutamate	0.2	0.2	0.2	0.2
Caprylyl Glycol	0.2	0.2	0.2	0.2
Stearyl Alcohol	0.5	0.5	0.5	0.5
Isopropyl Lauroyl Sarcosinate	2	2	2	2
Isononyl Isononanoate	4	4	4	4
Diisopropyl Sebacate	1	1	1	1
Octocrylene	2	2	2	2
Ethylhexyl Salicylate	4.5	4.5	4.5	4.5
Bis-Ethylhexyloxyphenol Methoxyphenyl Triazine	3	3	3	3
Ethylhexyl Triazone	4.3	4.3	4.3	4.3
Butyl Methoxydibenzoylmethane	3	3	3	3
Cetearyl Alcohol (and) Cetearyl Glucoside *	1.4	1.4	1.4	1.4
Tocopherol	1	1	1	1
Fragrance	0.4	0.4	0.4	0.4
Diisopropyl Sebacate	1	1	1	1
Carbomer	0.1	0.1	0.1	0.1
Ammonium Acryloyldimethyltaurate/VP	0.35	0.35	0.35	0.35
Xanthan Gum	0.03	0.03	0.03	0.03

(Continued)

(Continued)

Silica		1.5	1.5	1.5	1.5
Acrylonitrile/Methyl Methacrylate/Vinylidene Chloride Copolymer		0.05	0.05	0.05	0.05
Alcohol Denat.		4.8	4.8	4.8	4.8
Methylene Bis-Benzotriazolyl Tetramethylbutylphenol		2	2	2	2
Sensory Evaluations	Immediate Cooling Effect	Good	Fair	Good	Good
	Lasting Cooling Effect	Good	Poor	Poor	Poor
	Re-Cooling Effect	Good	Fair	Poor	Fair
Temperature Decreasing Effect (°C)		2.5	1.5	1.8	0.9

* MONTANOV 68® by Seppic, comprising 80% Cetearyl Alcohol and 20% Cetearyl Glucoside

[Evaluations]

The compositions according to Example 1 and Comparative Examples 1-3 were evaluated as follows.

(Sensory Evaluations)

4 professional panelists evaluated "immediate cooling effect", "lasting cooling effect", and "re-cooling effect" by using the same amount of each of the compositions according to Example 1 and Comparative Examples 1-3.

The term "immediate cooling effect" means cooling sensation just after the application of each of the compositions according to Example 1 and Comparative Examples 1-3 to the skin.

The term "lasting cooling effect" means cooling sensation lasting for a certain period of time such as several hours after the application of each of the compositions according to Example 1 and Comparative Examples 1-3 to the skin.

The term "re-cooling effect" means cooling sensation revived by spraying the same amount of water in the form of a mist onto the skin, after the cooling sensation has once been lost.

The panelists rated the above effects from 0 (poor) to 3 (very good), which was then classified in the following 3 categories based on the average of the rate.

Good: from 2.0 to 3.0
Fair: from 1.0 to less than 2.0
Poor: from 0 to less than 1.0

The results are shown in Table 1.

(Temperature Decreasing Effect)

Each of the compositions according to Example 1 and Comparative Examples 1-3 was applied onto a polypropylene sheet such that it forms a layer with a thickness of 200 μm. The layer on the polypropylene sheet was dried at room temperature for 24 hours. The initial temperature of the dried film was measured with an infrared thermal imaging camera (InfReC R300SR by Nippon Avionics Co., Ltd.). After spraying 0.07 g of water 3 times onto the dried film, the temperature of the film was again measured with the same infrared thermal imaging camera to determine the temperature of the film after spraying water. The temperature difference was obtained by the equation: the initial temperature of the dried film – the temperature of the film after spraying water. The temperature difference (decreased temperature) is shown in Table 1 in the line of "Temperature Decreasing Effect".

The composition according to Example 1 including all the above-described ingredients (a), (b) and (c) exerted sufficient or good immediate cooling, lasting cooling, and re-cooling effects, and considerably decreased the temperature of a subject to which the composition was applied.

The composition according to Comparative Example 1 including only the above-described ingredients (a) and (c), lacking the above-described ingredient (b), exerted less immediate

cooling and re-cooling effects. The lasting cooling effect provided by the composition according to Comparative Example 1 was poor, although this composition included cyclodextrin and xylitol.

The composition according to Comparative Example 2 including only the above-described ingredients (a) and (b), lacking the above-described ingredient (c), exerted poor lasting cooling and re-cooling effects.

The composition according to Comparative Example 3 including only the above-described ingredients (b) and (c), lacking the above-described ingredient (a), exerted less re-cooling effect. The lasting cooling effect provided by the composition according to Comparative Example 2 was poor, although this composition included cyclodextrin and menthoxypropanediol.

CLAIMS

1. A composition, preferably a cosmetic composition, and more preferably a skin cosmetic composition, comprising:
   (a) at least one endothermic substance;
   (b) at least one compound selected from menthol and derivatives thereof; and
   (c) at least one compound selected from cyclodextrin and derivatives thereof.

2. The composition according to Claim 1, wherein the (a) endothermic substance is selected from sugar alcohols.

3. The composition according to Claim 1 or 2 , wherein the (a) endothermic substance is selected from the group consisting of mannitol, erythritol, xylitol, sorbitol, arabitol, pentaerythritol, and mixtures thereof.

4. The composition according to any one of Claims 1 to 3, wherein the amount of the (a) endothermic substance in the composition is from 0.01 to 30% by weight, preferably from 0.1 to 20% by weight, and more preferably from 1 to 10% by weight, relative to the total weight of the composition.

5. The composition according to any one of Claims 1 to 4, wherein the (b) compound is selected from esters and ethers of menthol, preferably carboxylates and glyceryl ethers, and more preferably menthoxypropanediol.

6. The composition according to any one of Claims 1 to 5, wherein the amount of the (b) compound(s) in the composition is from 0.001 to 20% by weight, preferably from 0.01 to 10% by weight, and more preferably from 0.1 to 1% by weight, relative to the total weight of the composition.

7. The composition according to any one of Claims 1 to 6, wherein the (c) compound is selected from α-cyclodextrin, β-cyclodextrin, γ-cyclodextrin and mixtures thereof, preferably β-cyclodextrin.

8. The composition according to any one of Claims 1 to 7, wherein the amount of the (c) compound in the composition is from 0.01 to 30% by weight, preferably from 0.1 to 20% by weight, and more preferably from 1 to 10% by weight, relative to the total weight of the composition.

9. The composition according to any one of Claims 1 to 8, wherein the composition further comprises (d) water.

10. The composition according to Claim 9, wherein the amount of the (d) water in the composition is from 10% to 80% by weight, preferably from 20% to 70% by weight, and more preferably from 30% to 60%% by weight, relative to the total weight of the composition.

11. The composition according to any one of Claims 1 to 9, wherein the composition further comprises (e) at least one oil.

12. The composition according to any one of Claims 1 to 10, wherein the composition further comprises (f) at least one UV filter, preferably organic UV filter.

13. The composition according to Claim 11 or 12, wherein the composition is in the form of an emulsion, preferably in the form of an O/W emulsion.

14. A cosmetic process for a keratin substance, preferably skin, comprising applying to the keratin substance the composition according to any one of Claims 1 to 13.

15. A use of a combination of
(a) at least one endothermic substance,
(b) at least one compound selected from menthol and derivatives thereof, and
(c) at least one compound selected from cyclodextrin and derivatives thereof
in a composition in order to make the composition capable of providing sufficient immediate cooling, long-lasting cooling, and re-cooling effects.

INTERNATIONAL SEARCH REPORT

International application No
PCT/JP2018/040010

A. CLASSIFICATION OF SUBJECT MATTER
INV. A61K8/34 A61K8/73 A61Q19/00
ADD.

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

B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)
A61K A61Q

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

Electronic data base consulted during the international search (name of data base and, where practicable, search terms used)

EPO-Internal, WPI Data

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	US 2013/022652 A1 (ANDERSEN CARSTEN [DK] ET AL) 24 January 2013 (2013-01-24) table 3.1	1-3
X	WO 2013/144317 A2 (GIVAUDAN SA [CH]) 3 October 2013 (2013-10-03) example 4	1,15
X	DATABASE GNPD [Online] MINTEL; 5 November 2013 (2013-11-05), anonymous: "Tired Eyes", XP055541394, retrieved from www.gnpd.com Database accession no. 2165158	1-4,6-14
Y	the whole document	1

-/--

[X] Further documents are listed in the continuation of Box C.

[X] 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
15 January 2019	25/01/2019

Name and mailing address of the ISA/	Authorized officer
European Patent Office, P.B. 5818 Patentlaan 2 NL - 2280 HV Rijswijk Tel. (+31-70) 340-2040, Fax: (+31-70) 340-3016	Skulj, Primoz

1

C(Continuation). DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	DATABASE GNPD [Online] MINTEL; 25 February 2011 (2011-02-25), anonymous: "Moisture Lotion", XP055541404, retrieved from www.gnpd.com Database accession no. 1505374	1-14
Y	the whole document	1

X	DATABASE GNPD [Online] MINTEL; 23 October 2014 (2014-10-23), anonymous: "Redensifying Gel-Cream for Neck & Décolleté", XP055541410, retrieved from www.gnpd.com Database accession no. 2623769	1,15
Y	the whole document	1

Y	EP 0 837 760 A1 (GILLETTE CO [US]) 29 April 1998 (1998-04-29) paragraphs [0004], [0006]	1

Y	US 2011/091531 A1 (FURRER STEFAN MICHAEL [US] ET AL) 21 April 2011 (2011-04-21) the whole document paragraphs [0002], [0031]	1

Y	WO 01/54661 A1 (PROCTER & GAMBLE [US]) 2 August 2001 (2001-08-02) page 72	1

Y	Anonym: "Technical data sheet for CAVAMAX W7/L-MENTHOL-COMPLEX", , 3 March 2010 (2010-03-03), XP055541628, Retrieved from the Internet: URL:https://www.brenntag.com/media/documents/bsi/product_data_sheets/life_science/wacker_cyclodextrins_for_pc/cavamax_w7l_menthol_pds.pdf [retrieved on 2019-01-14] page 1 - left-hand column	1

1

INTERNATIONAL SEARCH REPORT

Information on patent family members

International application No
PCT/JP2018/040010

Patent document cited in search report	Publication date	Patent family member(s)	Publication date
US 2013022652 A1	24-01-2013	DK 2178521 T3	28-04-2014
		EP 2178521 A1	28-04-2010
		US 2010260818 A1	14-10-2010
		US 2013022652 A1	24-01-2013
		WO 2009006898 A1	15-01-2009
WO 2013144317 A2	03-10-2013	NONE	
EP 0837760 A1	29-04-1998	AR 002635 A1	25-03-1998
		AT 176616 T	15-02-1999
		AU 695164 B2	06-08-1998
		BR 9609457 A	02-03-1999
		CA 2224223 A1	23-01-1997
		CO 4750633 A1	31-03-1999
		DE 69601542 D1	25-03-1999
		DE 69601542 T2	19-08-1999
		EP 0837760 A1	29-04-1998
		ES 2129980 T3	16-06-1999
		JP H11508897 A	03-08-1999
		US 5653971 A	05-08-1997
		WO 9702117 A1	23-01-1997
		ZA 9605481 B	27-01-1997
US 2011091531 A1	21-04-2011	BR PI0913127 A2	05-01-2016
		CN 102036716 A	27-04-2011
		EP 2296759 A1	23-03-2011
		JP 2011520925 A	21-07-2011
		KR 20110020777 A	03-03-2011
		SG 193815 A1	30-10-2013
		US 2011091531 A1	21-04-2011
		WO 2009140783 A1	26-11-2009
WO 0154661 A1	02-08-2001	AU 3456101 A	07-08-2001
		BR 0107791 A	18-02-2003
		CA 2396627 A1	02-08-2001
		CN 1396821 A	12-02-2003
		CZ 20022328 A3	13-11-2002
		EP 1250123 A1	23-10-2002
		JP 2003521490 A	15-07-2003
		KR 20030005170 A	17-01-2003
		MX PA02007297 A	29-11-2002
		WO 0154661 A1	02-08-2001