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(54) Title: MASK FOR CARING FOR KERATIN MATERIALS

(57) Abstract: A mask for caring for keratin materials is provided, which comprises: i) an occlusive substrate with a moisture vapor transmission rate from 0.01-10 g/m²/24h; and ii) a composition impregnated into the occlusive substrate, wherein the composition comprises: a) at least one surfactant selected from polyglyceryl fatty acid esters with HLB>10; and b) at least one C-glycoside. A non-therapeutic process for caring for keratin materials is also provided.

WO 2024/239133 A1

MASK FOR CARING FOR KERATIN MATERIALS

TECHNICAL FIELD

The present invention relates to a cosmetic mask for topical application. In particular, the present invention relates to a mask, preferably for caring for keratin materials. The present invention also relates to a non-therapeutic process for caring for keratin materials.

BACKGROUND ART

Skin is the protective barrier for the human body. It protects the interior of the body from physical injury (such as trauma) and biological injury (such as bacterial, viruses or fungi).

Skin is made up of several layers of cells which coat and protect the underlying tissue. The keratin and collagen fibrous proteins form the skeleton of its structure. The outermost of these layers, referred to as the stratum corneum.

The development of formulations dedicated to caring for the skin is permanent.

Occlusive patches are used to boost the penetration of active ingredients for transdermal drug delivery, but they need long time application, for example, more than 8 hours, it is not applicable to the cosmetic field.

Thus, it is desired to develop similar products like masks for delivering cosmetic active ingredients such as C-glycoside to keratin materials in a short time, for example, within no more than 30 minutes.

SUMMARY OF THE INVENTION

One aim of the present invention is to provide masks, preferably for caring for keratin materials, which can deliver cosmetic active ingredients to keratin materials within no more than 30 minutes.

Another aim of the present invention is to provide a non-therapeutic process for caring for keratin materials using the masks mentioned above.

Thus, in a first aspect, the present invention provides a mask, preferably for caring for keratin materials, comprising:

i) an occlusive substrate with a moisture vapor transmission rate from 0.01 to 10 g/m²/24h; and

ii) a composition impregnated into the occlusive substrate, wherein the composition comprises:

a) at least one surfactant selected from polyglyceryl fatty acid esters with HLB >10; and

b) at least one C-glycoside.

The mask according to the present invention can effectively deliver C-glycoside to the keratin materials within 30 minutes.

The inventors have found that the occlusive substrate with moisture vapor transmission rate in a specific range and the surfactant selected from polyglyceryl fatty acid esters with HLB >10 results in good efficacy on penetration of the active ingredient contained in the mask, i.e. C-glycoside, to keratin materials.

In a second aspect, the present invention provides a non-therapeutic process for caring for keratin materials, comprising applying the mask according to the present invention to the keratin materials.

Other subjects and characteristics, aspects and advantages of the present invention will emerge even more clearly on reading the detailed description and the examples that follow.

DETAILED DESCRIPTION OF THE INVENTION

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

In that which follows and unless otherwise indicated, the limits of a range of values are included within this range, in particular in the expressions "between ... and ..." and "from ... to ...".

Moreover, the expression "at least one" used in the present description is equivalent to the expression "one or more".

Throughout the instant application, the term "comprising" is to be interpreted as encompassing all specifically mentioned features as well

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

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

For the purposes of the present invention, the term “keratin material” is intended to cover human skin. Facial skin is most particularly considered according to the present invention.

All percentages in the present invention refer to weight percentage, unless otherwise specified.

The mask according to the present invention comprises:

- i) an occlusive substrate with a moisture vapor transmission rate from 0.01 to 10 g/m²/24h; and
- ii) a composition impregnated into the occlusive substrate, wherein the composition comprises:
 - a) at least one surfactant selected from polyglyceryl fatty acid esters with HLB >10; and
 - b) at least one C-glycoside.

Occlusive substrate

For the purpose of the invention, the term “occlusive substrate” means that the substrate can work by forming a protective layer on the surface of the skin and create a barrier to prevent moisture loss.

The occlusive substrate has a moisture vapor transmission rate (MVTR) from 0.01 to 10 g/m²/24h, preferably from 0.1 to 5 g/m²/24h, more preferably 0.1 to 3 g/m²/24h, even more preferably 0.2 to 1 g/m²/24h.

In some embodiments, the occlusive substrate has a moisture vapor transmission rate (MVTR) from 0.25 to 0.48 g/m²/24h.

The moisture vapor transmission rate can be tested according to

ASTM F1249-20.

In particular, the moisture vapor transmission rate can be tested as follows: a dry chamber is separated from a wet chamber of known temperature $38 \pm 0.5^\circ\text{C}$ and humidity 100% by the material layer to be tested. The dry chamber and the wet chamber make up a diffusion cell in which the material layer is sealed. Water vapor diffusing through the material layer mixes with the gas in the dry Chamber and is carried to a pressure-modulate infrared sensor. The sensor can transfer the electronic signal into the water vapor concentration. The diffusion will last for 24hours. Then the water vapor concentration is divided by the area of the diffusion chamber to get the MVTR ($\text{g}/\text{cm}^2/24\text{h}$).

Preferably, the occlusive substrate comprises:

- a) a non-water transmission film layer; and
- b) a non-woven fabric layer.

As used herein, a non-water transmission film layer means a film layer which is impervious to water at the pressure of 1Mpa.

Preferably, the non-water transmission film layer is made from a material selected from polyethylene(PE), polyethylene terephthalate(PET), polyamide(PA), aluminium foil , aluminium oxide, silicone and mixtures thereof.

Preferably, the non-woven fabric layer consists of fibers selected from synthetic polymer fibers, semi-nature fibers, nature fibers and mixtures thereof.

As examples of synthetic polymer fibers, mention can be made of polyester fibers, polyethylene terephthalate fibers, polyethylene fibers, and polypropylene fibers.

As an example of semi-natural fibers, mention can be made of viscose rayon fibers.

As examples of natural fibers, mention can be made of such as cotton, pulp, bamboo and cellulose fibers.

The occlusive substrate can be prepared by laminating the non-water transmission film layer and the non-woven fabric layer.

The skilled person in the art can determine the thicknesses of the non-water transmission film layer and the non-woven fabric layer based on the intended purpose.

The occlusive substrate can have a wide variety of shapes, depending on the desired use and characteristic of the mask.

The occlusive substrate is typically designed to fit the area of the skin to which topical application is desired. For example, when the mask is applied to the face, the substrate is designed to correspond to the shape of the face avoiding the eye, nostril, and mouth areas, as necessary.

The occlusive substrate suitable for the mask according to the present invention is commercially available. As examples of commercial products suitable for use as the occlusive substrate, mention can be made of those sold under the trade names NR92050- (Rayon 55 % / Pulp 41% / PE 4%)5 μ m and NR92040 AL by the company Sanwa.

The skilled person in the art can choose a suitable substrate and the weight ratio of the substrate used and the composition according to the present invention based on the nature of the composition.

Polyglyceryl fatty acid esters

The composition used in the mask according to the present invention comprises at least one surfactant selected from polyglyceryl fatty acid esters with HLB >10.

The term HLB ("hydrophilic-lipophilic balance") is well known to those skilled in the art, and reflects the ratio between the hydrophilic part and the lipophilic part in the molecule.

For the purpose of the present invention, it is preferable that the polyglyceryl fatty acid ester have a polyglycerol moiety derived from 2 to 10 glycerols, more preferably from 3 to 6 glycerols, and further more preferably 5 or 6 glycerols.

The polyglyceryl fatty acid ester may be selected from the mono-, di- and tri- esters of saturated or unsaturated fatty acid, including 2 to 30 carbon atoms, preferably 6 to 30 carbon atoms, and more preferably 8 to 30 carbon atoms, such as capric acid, caprylic acid, lauric acid, myristic acid, stearic acid, isostearic acid, and oleic acid.

The polyglyceryl fatty acid ester may be selected from the group consisting of:

PG5 caprylate, PG5 caprate, PG5 dicaprate, PG5 tricaprato, PG5 laurate, PG5 myristate, PG5 dimyristate, PG5 stearate, PG5 isostearate, PG5 diisostearate, PG5 oleate, PG5 dioleate.

PG6 caprylate, PG6 dicaprylate, PG6 caprate, PG6 dicaprate, PG6 laurate, PG6 myristate, PG6 dimyristate, PG6 stearate, PG6 isostearate, PG6 oleate, PG6 dioleate,

PG10 caprylate, PG10 dicaprylate, PG10 tricaprylate, PG10 caprate, PG10 dicaprate, PG10 tricaprato, PG10 laurate, PG10 dilaurate, PG10 myristate, PG10 dimyristate, PG10 stearate, PG10 distearate, PG10 tristearate, PG10 isostearate, PG10 diisostearate, PG10 oleate, PG10 dioleate

It is preferable that the polyglyceryl fatty acid ester is selected from:

- polyglyceryl monocaprylates comprising 3 to 6 glycerol units,
 - polyglyceryl monolaurates comprising 3 to 6 glycerol units,
 - polyglyceryl mono(iso)stearates comprising 3 to 6 glycerol units,
 - polyglyceryl monooleates comprising 3 to 6 glycerol units,
 - polyglyceryl dioleates comprising 3 to 6 glycerol units, and
 - polyglyceryl monocaprates comprising 3 to 6 glycerol units,
- And mixtures thereof.

More preferably, the polyglyceryl fatty acid ester is selected from polyglyceryl monocaprylates comprising 3 to 6 glycerol units, polyglyceryl monolaurates comprising 3 to 6 glycerol units, polyglyceryl monocaprates comprising 3 to 6 glycerol units and mixtures thereof.

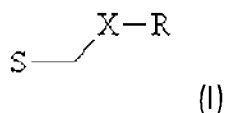
Most preferably, the surfactant selected from polyglyceryl fatty acid esters with HLB >10 is polyglyceryl-6 caprylate.

Advantageously, the surfactant selected from polyglyceryl fatty acid esters with HLB >10 is present in the composition according to the present invention in an amount ranging from 0.5 wt.% to 15 wt.%, preferably from 2 wt.% to 12 wt.%, more preferably from 3 wt.% to 10 wt.%, relative to the total weight of the composition.

C-glycosides

According to the first aspect, the composition of the present invention comprises at least one C-glycoside.

Preferably, the C-glycoside is selected from compounds of formula (I):



in which:

- R represents a saturated C₁ to C₁₀, in particular C₁ to C₄, alkyl radical which can optionally be substituted by at least one radical selected from OH, COOH or COOR''₂, with R''₂ being a saturated C₁-C₄ alkyl radical,

- S represents a monosaccharide or a polysaccharide comprising up to 20 sugar units, in particular up to 6 sugar units, in pyranose and/or furanose form and of the L and/or D series, it being possible for the said monosaccharide or polysaccharide to be substituted by a hydroxyl group which is necessarily free and optionally one or more optionally protected amine functional group(s), and

- X represents a radical selected from the -CO-, -CH(OH)-, -CH(NH₂)-, -CH(NHCH₂CH₂CH₂OH)-, -CH(NHPh)- and -CH(CH₃)- groups and in particular a -CO-, -CH(OH)- or -CH(NH₂)- radical and more particularly a -CH(OH)- radical,

the S-CH₂-X bond represents a bond of C-anomeric nature, which can be α or β,

and also their physiologically acceptable salts, their solvates, such as the hydrates, and their optical and geometrical isomers.

The C-glycoside of use for the implementation of the invention are in particular those for which R denotes a saturated linear C₁ to C₆, in particular C₁ to C₄, preferentially C₁ to C₂, alkyl radical and more preferably a methyl radical.

Mention may in particular be made, among the alkyl groups suitable for the implementation of the invention, of the methyl, ethyl, isopropyl, n-propyl, n-butyl, t-butyl, isobutyl, sec-butyl, pentyl, n-hexyl, cyclopropyl, cyclopentyl or cyclohexyl groups.

According to one embodiment of the invention, use may be made of a C-glycoside corresponding to the formula (I) for which S can represent a monosaccharide or a polysaccharide comprising up to 6 sugar units, in pyranose and/or furanose form and of L and/or D series, the said mono- or polysaccharide exhibiting at least one

necessarily free hydroxyl functional group and/or optionally one or more necessarily protected amine functional groups, X and R otherwise retaining all of the definitions given above.

Advantageously, a monosaccharide of the invention can be selected from D-glucose, D-galactose, D-mannose, D-xylose, D-lyxose or L-fucose, L-arabinose, L-rhamnose, D-glucuronic acid, D-galacturonic acid, D-iduronic acid, N-acetyl-D-glucosamine or N-acetyl-D-galactosamine and advantageously denotes D-glucose, D-xylose, N-acetyl-D-glucosamine or L-fucose and in particular D-xylose.

More particularly, a polysaccharide of the invention comprising up to 6 sugar units can be selected from D-maltose, D-lactose, D-cellobiose, D-maltotriose, a disaccharide combining a uronic acid selected from D-iduronic acid or D-glucuronic acid with a hexosamine selected from D-galactosamine, D-glucosamine, N-acetyl-D-galactosamine or N-acetyl-D-glucosamine, an oligosaccharide comprising at least one xylose which can advantageously be selected from xylobiose, methyl- β -xylobioside, xylotriose, xylotetraose, xylopentaose and xylohexaose and in particular xylobiose, which is composed of two xylose molecules linked via a 1-4 bond.

More particularly, S can represent a monosaccharide selected from D-glucose, D-xylose, L-fucose, D-galactose or D-maltose and in particular D-xylose.

Preferably, use is made of a C-glycoside of formula (I) for which:

- R denotes an unsubstituted linear C₁-C₄, in particular C₁-C₂, alkyl radical, especially a methyl radical;
- S represents a monosaccharide as described above and selected in particular from D-glucose, D-xylose, N-acetyl-D-glucosamine or L-fucose, and in particular D-xylose;
- X represents a group selected from -CO-, -CH(OH)- or -CH(NH₂)- and preferably a -CH(OH)- group.

The acceptable salts of the compounds described in the present invention comprise conventional non-toxic salts of the said compounds, such as those formed from organic or inorganic acids. Mention may be made, by way of example, of the salts of inorganic acids, such as sulfuric acid, hydrochloric acid. Mention may also be made of the salts of organic acids, which can comprise one or more carboxylic, sulfonic

or phosphonic acid groups. Mention may in particular be made of propionic acid, acetic acid, terephthalic acid, citric acid and tartaric acid.

When the compound of formula (I) comprises an acid group, neutralization of the acid group(s) can be carried out with an inorganic base, such as LiOH, NaOH, KOH, $\text{Ca}(\text{OH})_2$, NH_4OH , $\text{Mg}(\text{OH})_2$ or $\text{Zn}(\text{OH})_2$, or with an organic base, such as a primary, secondary or tertiary alkylamine, for example triethylamine or butylamine. This primary, secondary or tertiary alkylamine can comprise one or more nitrogen and/or oxygen atoms and can thus comprise, for example, one or more alcohol functional groups; mention may in particular be made of 2-amino-2-methylpropanol, triethanolamine, 2-(dimethylamino)propanol or 2-amino-2-(hydroxymethyl)-1,3-propanediol. Mention may also be made of lysine or 3-(dimethylamino)propylamine.

The solvates which are acceptable for the compounds described in the present invention comprise conventional solvates, such as those formed during the final stage of preparation of the said compounds due to the presence of solvents. Mention may be made, by way of example, of the solvates due to the presence of water or of linear or branched alcohols, such as ethanol or isopropanol.

Of course, according to the invention, a C-glycoside corresponding to the formula (I) can be used alone or as a mixture with other C-glycoside and in any proportion.

A C-glycoside which is suitable for the invention can in particular be obtained by the synthetic method described in the document WO 02/051828.

Mention may in particular be made, by way of non-limiting illustration of the C-glycoside compounds which are particularly suitable for the invention, of the following compounds:

- C- β -D-xylopyranoside-n-propane-2-one,
- C- α -D-xylopyranoside-n-propan-2-one,
- C- β -D-xylopyranoside-2-hydroxypropane,
- C- α -D-xylopyranoside-2-hydroxypropane,
- 1-(C- β -D-fucopyranoside)propan-2-one,
- 1-(C- α -D-fucopyranoside)propan-2-one,

- 1-(C- β -L-fucopyranoside)propan-2-one,
- 1-(C- α -L-fucopyranoside)propan-2-one,
- 1-(C- β -D-fucopyranoside)-2-hydroxypropane,
- 1-(C- α -D-fucopyranoside)-2-hydroxypropane,
- 1-(C- β -L-fucopyranoside)-2-hydroxypropane,
- 1-(C- α -L-fucopyranoside)-2-hydroxypropane,
- 1-(C- β -D-glucopyranosyl)-2-hydroxypropane,
- 1-(C- α -D-glucopyranosyl)-2-hydroxypropane,
- 1-(C- β -D-galactopyranosyl)-2-hydroxypropane,
- 1-(C- α -D-galactopyranosyl)-2-hydroxypropane,
- 1-(C- β -D-fucofuranosyl)propan-2-one,
- 1-(C- α -D-fucofuranosyl)propan-2-one,
- 1-(C- β -L-fucofuranosyl)propan-2-one,
- 1-(C- α -L-fucofuranosyl)propan-2-one,
- C- β -D-maltopyranoside-n-propan-2-one,
- C- α -D-maltopyranoside-n-propan-2-one,
- C- β -D-maltopyranoside-2-hydroxypropane,
- C- α -D-maltopyranoside-2-hydroxypropane, their isomers

and their mixtures.

According to one embodiment, C- β -D-xylopyranoside-2-hydroxypropane or C- α -D-xylopyranoside-2-hydroxypropane and better still C- β -D-xylopyranoside-2-hydroxypropane can advantageously be used for the preparation of a composition according to the invention.

According to a specific embodiment, the C-glycoside can be C- β -D-xylopyranoside-2-hydroxypropane (or hydroxypropyltetrahydropyrantriol) provided in the form of a solution containing 70% by weight of active material in water and propylene glycol.

Advantageously, the C-glycoside is present in the composition of the present invention in an amount ranging from 0.01 wt. % to 40 wt. %, preferably from 0.05 wt. % to 25 wt. %, and more preferably from 0.1 wt. % to 15 wt. %, relative to the total weight of the composition.

Aqueous phase

The composition of the present invention may comprise an

aqueous phase.

If presents, the aqueous phase of the composition according to the present invention comprises water and optionally one or more water-miscible or at least partially water-miscible organic solvents selected from monoalcohols containing from 2 to 6 carbon atoms such as ethoxydiglycol, and polyols especially containing from 2 to 20 carbon atoms.

The term "polyol" should be understood as meaning any organic molecule comprising at least two free hydroxyl groups. Examples of polyols that may be mentioned include glycols, for instance propanediol, butylene glycol, pentylene glycol, isoprene glycol, caprylyl glycol, glycerine and polyethylene glycols.

Advantageously, the composition according to the invention comprises at least one organic solvent, preferably selected from ethoxydiglycol, propanediol, glycerine, and combinations thereof.

If presents, the aqueous phase may represent from 40 wt.% to 95 wt.%, preferably from 70 wt.% to 90 wt.%, and more preferably from 80 wt.% to 90 wt.%, relative to the total weight of the composition.

Additional cosmetic active ingredients

The composition of the present invention may comprise one or more additional cosmetic active ingredient for caring for keratin materials in addition to C-glycoside.

It is easy for the skilled in the art to adjust the amount of the cosmetic active ingredient based on the final use of the composition according to the present invention.

Additional adjuvants or additives

The composition according to the present invention may also comprise one or more additional adjuvants or additives commonly used in compositions for caring for keratin materials, e.g., fragrances, additional surfactants, preserving agents and bactericides, pH regulators, and combinations thereof.

The skilled in the art can select the amount of the additional adjuvants or additive so as not to adversely impact the final use of the composition according to the present invention.

The composition may comprise additional surfactants, for example, at least one co-surfactant selected from oxyethylenated fatty acid esters of sorbitan, fatty acids with melting point $\leq 30^{\circ}\text{C}$, and combinations thereof. The co-surfactant can increase the solubility of cosmetic active ingredients in the composition by reducing the interfacial tension to a limit below that of the surfactants.

For the purpose of the present invention, it is preferable that oxyethylenated fatty acid esters of sorbitan have a fatty acid containing 10-30 carbon atoms, more preferably from 10-20 carbon atoms, and further more preferably from 12-18 carbon atoms.

The oxyethylenated fatty acid esters of sorbitan may be selected from the mono-, di- and tri- esters of saturated or unsaturated fatty acid, including 10 to 30 carbon atoms, preferably 10 to 20 carbon atoms, and more preferably 12 to 18 carbon atoms, such as lauric acid, myristic acid, stearic acid, isostearic acid, and oleic acid.

As examples of oxyethylenated fatty acid esters of sorbitan that may be used according to the invention, mention may be made of polysorbate 20, Polysorbate 40, Polysorbate 60, Polysorbate 65, Polysorbate 80, Polysorbate 85, PEG-5 sorbitan isostearate, PEG-20 sorbitan triisostearate, PEG-20 sorbitan isostearate, PEG-40 sorbitan septaoleate, PEG-20 sorbitan tetraoleate and PEG-20 sorbitan trioleate; preferably oxyethylenated fatty acid esters of sorbitan are polysorbate 20, sold under the name Tween 20® by Croda, or polysorbate 60, sold under the name Tween 60® by Croda, polysorbate 80, sold under the name TWEEN™ 80-LQ-(CQ) by Croda.

For the purpose of the present invention, it is preferable that fatty acid with melting point $\leq 30^{\circ}\text{C}$ may be used according to the invention, mention may be made of oleic acid, linoleic acid, arachidonic acid, and the mixtures thereof; more preferably, fatty acid with melting point $\leq 30^{\circ}\text{C}$ is oleic acid, sold under the name EDENOR OL 75 MY (RSPO MB) by EMERY OLEOCHEMICALS.

If presents, advantageously, the at least one co-surfactant selected from oxyethylenated fatty acid esters of sorbitan, fatty acids

with melting point $\leq 30^{\circ}\text{C}$, and combinations thereof is present in the composition according to the present invention in an amount ranging from 1 wt.% to 20 wt.%, preferably from 3 wt.% to 15 wt.%, more preferably from 3 wt.% to 10 wt.%, relative to the total weight of the composition.

In some embodiments, the composition comprises from 1 wt. % to 10 wt. %, preferably from 1 wt. % to 9 wt.%, more preferably 3 wt. % to 5 wt.% of at least one oxyethylenated fatty acid esters of sorbitan, relative to the total weight of the composition.

As examples of oxyethylenated fatty acid esters of sorbitan, mention can be made of polysorbate 80, and polysorbate 60.

In some embodiments, the composition comprises from 1 wt. % to 10 wt. %, preferably from 1 wt. % to 9 wt.%, more preferably 3 wt. % to 5 wt.% of fatty acid with melting point $\leq 30^{\circ}\text{C}$, relative to the total weight of the composition.

As examples of fatty acid with melting point $\leq 30^{\circ}\text{C}$, mention can be made of oleic acid.

According to a preferred embodiment, the present invention provides a mask, preferably for caring for keratin materials, comprising:

- i) an occlusive substrate with a moisture vapor transmission rate from 0.01-10 g/m²/24h; and
- ii) a composition impregnated into the occlusive substrate, wherein the composition comprises, relative to the total weight of the composition:
 - a) from 3 wt.% to 10 wt.% of at least one surfactant selected from polyglyceryl monocaprates comprising 3 to 6 glycerol units; and
 - b) from 0.1 wt.% to 15 wt.% of at least one C-glycoside selected from C- β -D-xylopyranoside-2-hydroxypropane, C- α -D-xylopyranoside-2-hydroxypropane, and combinations thereof.

Method and use

The mask according to the present invention is intended for topical application.

The mask according to the present invention can be used to effectively deliver the active ingredients contained therein to keratin materials.

According to the second aspect, the present invention provides a non-therapeutic process for caring for keratin materials, comprising applying the mask according to the present invention to the keratin materials.

In particular, the keratin materials are the facial skin.

EXAMPLES

The following examples serve to illustrate the present invention without, however, being limiting in nature.

Main raw materials used, trade names and supplier thereof were listed in Table 1.

Table 1

INCI Name	Trade Name	Supplier
Oleic acid	EDENOR OL 75 MY (RSPO MB)	EMERY OLEOCHEMICALS
Polysorbate 80	TWEEN™ 80-LQ-(CQ)	CRODA
Polyglyceryl-6 caprylate	SUNSOFT® Q-8H-C	TAIYO KAGAKU
Cetearyl alcohol	LANETTE® O OR	BASF
Polyglyceryl-5 laurate	SUNSOFT® A-121E-C	TAIYO KAGAKU
Ceteareth-20	EUMULGIN® B 2	BASF
PEG-8 glyceryl isostearate	UNIOX™ GM-8IS	NOF
Oleth-3 phosphate	CRODAFOS® O3A-LQ-(MH)	Croda

Substrates used, trade names and supplier thereof were listed in Table 2.

Table 2

Composition	Trade Name	Supplier
100% PET	TT-70	Daiwa
Nonwoven 50g/sqm (Rayon/Pulp/PE = 55%/41%/4%) / PE 5micron	NR92050-5um	Sanwa
Nonwoven 40g/sqm (Rayon/Pulp/PE = 55%/41%/4%) / PE 12 micron / AL 7 micron / PE 10 micron	NR92040 AL	Sanwa

Invention Examples 1-4 and Comparative Examples 1-4

Compositions according to invention examples (IE) 1-4 and comparative examples (CE) 1-4 were prepared with the ingredients

listed in Table 3 (the contents were expressed as weight percentages of ingredients with regard to the total weight of each composition, unless otherwise indicated).

The compositions were prepared as follows, taking composition of invention example 1 as an example:

1. adding the hydroxypropyl tetrahydropyrantriol into water, mildly mixing until dissolving to obtain a water phase.
2. heating the water phase to 65°C, adding the other ingredients into the hot water phase.
3. homogenizing under a shearing rate >1000rpm for 5 minutes.
4. stirring at 150 rpm until cooling down the temperature to room temperature to obtain the composition.

Then the compositions obtained were impregnated into an occlusive substrate as indicated in Table 3 by 70-80 mg/cm².

Table 3

Components	IE. 1	IE. 2	IE.3	IE. 4	CE. 1	CE. 2	CE. 3	CE. 4
Hydroxypropyl tetrahydropyrantriol	3.15	3.15	3.15	3.15	3.15	3.15	3.15	3.15
Polyglyceryl-6 caprylate	5	5	3	10	5	5	-	-
Polysorbate 80	5	5	10	-	5	5	13	-
Oleic acid	3	3	-	3	3	3	-	-
PEG-8 glyceryl isostearate	-	-	-	-	-	-	-	3
Oleth-3 phosphate	-	-	-	-	-	-	-	1
Glycerin	5	5	5	5	5	5	5	5
Ethoxydiglycol	2.5	2.5	2.5	2.5	2.5	2.5	2.5	2.5
Propanediol	2.5	2.5	2.5	2.5	2.5	2.5	2.5	2.5
Water	QS100	QS100	QS100	QS100	QS100	QS100	QS100	QS100
Substrate	NR92050_5um	NR92040 AL	NR92040 AL	NR92040 AL	TT-70	TT-70	NR92040 AL	NR92040 AL
Moisture vapor transmission rate (MVTR) of the substrate (g/m ² /24h)	0.25	0.48	0.48	0.48	300	300	0.48	0.48
Application time (min)	20	20	20	20	20	60	20	20

Evaluation of delivery effect of different masks

The delivery effect of different masks was evaluated by a fluorescence intensity test as follows.

Formula preparation:

Fluorescein dye (chemical name: 3',6'-dihydroxyspiro[2-benzofuran-3,9'-xanthene]-1-one) was mixed into the composition of the mask to be tested at a concentration of 50 ppm in advance to obtain the sample to be tested, which was stored at room temperature in a dark room.

Ex vivo skin preparation:

Porcine ear was taken out of -20°C, and cleaned with water. A porcine skin was cut from an ear with surgical blade. The porcine skin was put on a wet tissue to keep humidified. Hairs on porcine skin surface were snipped.

The porcine skin on a wet tissue was stored at 4°C overnight.

The masks to be tested were covered onto the porcine skin for 20 to 60 minutes according to test requirements indicated in Table 3.

Formula residue was wiped off by dry tissues, then dishes with the porcine skin was transferred into an oven at 32°C for 2 hours.

A 10mm x 10mm part was cut from that porcine skin, then freeze with optical coherence tomography (medium) at -80°C.

The cryosection skin samples were cut in 14 μm by Cryostat CM3050 S machine. Then images were taken by confocal microscope.

A Nikon A1R MP microscope was used in this test. Confocal microscope was used to observe fluorescein dye signal. At 500nm to 550nm of emission wave, fluorescein dye signal was captured.

Result of the fluorescein intensity is presented by pixel.

The masks will be considered effectively deliver the active ingredient contained therein to keratin materials when the fluorescence intensity is more than 4000 pixel. The higher pixel data, the stronger penetration of water soluble active hydroxypropyl tetrahydropyrantriol.

The fluorescence intensity delivered by masks of invention examples (IE) 1-4 and comparative examples (CE) 1-4 were summarized in Table 4 below.

Table 4

	IE.1	IE.2	IE.3	IE.4	CE.1	CE.2	CE.3	CE.4
Fluorescence intensity (pixl)	5800	5000	4500	4800	1500	3400	2100	3100

It can be seen from Table 4 that the mask according to the present invention can effectively deliver the active ingredient contained therein to keratin materials within 30 minutes.

It can be also seen that the occlusive substrate with a specific range of moisture vapor transmission rate and the surfactant selected from polyglyceryl fatty acid esters with HLB >10 result in synergetic efficacy on penetration of the active ingredient contained in the mask to keratin materials.

CLAIMS

1. A mask, preferably for caring for keratin materials, comprising:
i) an occlusive substrate with a moisture vapor transmission rate from 0.01-10 g/m²/24h; and

ii) a composition impregnated into the occlusive substrate, wherein the composition comprises:

a) at least one surfactant selected from polyglyceryl fatty acid esters with HLB >10; and

b) at least one C-glycoside.

2. The mask of claim 1, wherein the surfactant is selected from:

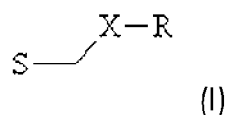
- polyglyceryl monocaprylates comprising 3 to 6 glycerol units,
- polyglyceryl monolaurate comprising 3 to 6 glycerol units,
- polyglyceryl mono(iso)stearate comprising 3 to 6 glycerol units,
- polyglyceryl monooleate comprising 3 to 6 glycerol units,
- polyglyceryl dioleate comprising 3 to 6 glycerol units, and
- polyglyceryl monocaprates comprising 3 to 6 glycerol units; and
- mixtures thereof,

preferably, the polyglyceryl fatty acid ester is selected from polyglyceryl monocaprylates comprising 3 to 6 glycerol units, polyglyceryl monolaurates comprising 3 to 6 glycerol units, polyglyceryl monocaprates comprising 3 to 6 glycerol units, and mixtures thereof,

most preferably, the polyglyceryl fatty acid ester is polyglyceryl-6 caprylate.

3. The mask according to claim 1 or 2, wherein the surfactant is present in an amount ranging from 0.5 wt.% to 15 wt.%, preferably from 2 wt.% to 12 wt.%, more preferably from 3 wt.% to 10 wt.%, relative to the total weight of the composition.

4. The mask according to any of claims 1 to 3, wherein the C-glycoside is selected from compounds of formula (I):



in which:

- R represents a saturated C₁ to C₁₀, in particular C₁ to C₄, alkyl radical which can optionally be substituted by at least one radical selected from OH, COOH or COOR''₂, with R''₂ being a saturated C₁-C₄ alkyl radical,

- S represents a monosaccharide or a polysaccharide comprising up to 20 sugar units, in particular up to 6 sugar units, in pyranose and/or furanose form and of the L and/or D series, it being possible for the said monosaccharide or polysaccharide to be substituted by a hydroxyl group which is necessarily free and optionally one or more optionally protected amine functional group(s), and

- X represents a radical selected from the -CO-, -CH(OH)-, -CH(NH₂)-, -CH(NHCH₂CH₂CH₂OH)-, -CH(NHPh)- and -CH(CH₃)- groups and in particular a -CO-, -CH(OH)- or -CH(NH₂)- radical and more particularly a -CH(OH)- radical,

the S-CH₂-X bond represents a bond of C-anomeric nature, which can be α or β ,

and also their physiologically acceptable salts, their solvates, such as the hydrates, and their optical and geometrical isomers.

5. The mask according to any of claims 1 to 4, wherein the C-glycoside is selected from

- C- β -D-xylopyranoside-n-propane-2-one,
- C- α -D-xylopyranoside-n-propan-2-one,
- C- β -D-xylopyranoside-2-hydroxypropane,
- C- α -D-xylopyranoside-2-hydroxypropane,
- 1-(C- β -D-fucopyranoside)propan-2-one,
- 1-(C- α -D-fucopyranoside)propan-2-one,
- 1-(C- β -L-fucopyranoside)propan-2-one,
- 1-(C- α -L-fucopyranoside)propan-2-one,
- 1-(C- β -D-fucopyranoside)-2-hydroxypropane,
- 1-(C- α -D-fucopyranoside)-2-hydroxypropane,
- 1-(C- β -L-fucopyranoside)-2-hydroxypropane,
- 1-(C- α -L-fucopyranoside)-2-hydroxypropane,
- 1-(C- β -D-glucopyranosyl)-2-hydroxypropane,
- 1-(C- α -D-glucopyranosyl)-2-hydroxypropane,
- 1-(C- β -D-galactopyranosyl)-2-hydroxypropane,

- 1-(C- α -D-galactopyranosyl)-2-hydroxypropane,
- 1-(C- β -D-fucofuranosyl)propan-2-one,
- 1-(C- α -D-fucofuranosyl)propan-2-one,
- 1-(C- β -L-fucofuranosyl)propan-2-one,
- 1-(C- α -L-fucofuranosyl)propan-2-one,
- C- β -D-maltopyranoside-n-propane-2-one,
- C- α -D-maltopyranoside-n-propan-2-one,
- C- β -D-maltopyranoside-2-hydroxypropane,
- C- α -D-maltopyranoside-2-hydroxypropane,

their isomers and their mixtures.

6. The mask according to any of claims 1 to 5, wherein the C-glycoside is present in an amount ranging from 0.01 wt. % to 40 wt. %, preferably from 0.05 wt. % to 25 wt. %, and more preferably from 0.1 wt. % to 15 wt. %, relative to the total weight of the composition.

7. The mask according to any of claims 1 to 6, further comprises an aqueous phase.

8. The mask according to claim 7, wherein the aqueous phase comprises water and water-miscible or at least partially water-miscible organic solvents selected from monoalcohols containing from 2 to 6 carbon atoms and polyols especially containing from 2 to 20 carbon atoms; preferably, the organic solvent is selected from ethoxydiglycol, propanediol, glycerine, and combinations thereof.

9. The mask according to claim 7 or 8, wherein the aqueous phase represents from 40 wt.% to 95 wt.%, preferably from 70 wt.% to 90 wt.%, and more preferably from 80 wt.% to 90 wt.%, relative to the total weight of the composition.

10. The mask according to any of claims 1 to 9, further comprises at least one co-surfactant selected from oxyethylenated fatty acid esters of sorbitan, fatty acids with melting point $\leq 30^{\circ}\text{C}$, and combinations thereof.

11. The mask according to claim 10, wherein the co-surfactant is present in an amount ranging from 1 wt.% to 20 wt.%, preferably from 3 wt.% to 15 wt.%, more preferably from 3 wt.% to 10 wt.%, relative to the total weight of the composition.

12. The mask according to claim 1, comprising:

i) an occlusive substrate with a moisture vapor transmission rate from 0.01 to 10 g/m²/24h; and

ii) a composition impregnated into the occlusive substrate, wherein the composition comprises, relative to the total weight of the composition:

a) from 3 wt.% to 10 wt.% of at least one surfactant selected from polyglyceryl monocaprates comprising 3 to 6 glycerol units; and

b) from 0.1 wt.% to 15 wt.% of at least one C-glycoside selected from C- β -D-xylopyranoside-2-hydroxypropane, C- α -D-xylopyranoside-2-hydroxypropane, and combinations thereof.

13. A non-therapeutic process for caring for keratin materials, comprising applying the mask according to any of claims 1 to 12 to the keratin materials.

INTERNATIONAL SEARCH REPORT

International application No.

PCT/CN2023/095217

A. CLASSIFICATION OF SUBJECT MATTER

A61K8/60(2006.01)i; A61K8/37(2006.01)i; A61K8/02(2006.01)i

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

B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)

IPC: A61K

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

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

CNTXT, DWPL, ENTXT, ENTXTC, WPABSC: L'OREAL, KE LIXUAN, SHAO DAN, YAN ZHIPENG, WANG RANRAN, C-glycoside, hydroxypropyl tetrahydropyrantriol, pro-xylane, mositure, mvtr, occlusive, transmission, mask, g/m2/24h, polyglyceryl+, NR92050, NR92040

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
Y	WO 2022239257 A1 (L'OREAL) 17 November 2022 (2022-11-17) page 1 lines 30-35, page 2 lines 47-48, example 3	1-13
Y	CN 202086810 U (HUANG, F.) 28 December 2011 (2011-12-28) the abstract	1-13
Y	WO 2018129493 A1 (THE PROCTER & GAMBLE COMPANY) 12 July 2018 (2018-07-12) page 25 line 25 to page 26 line 18	1-13
A	WO 02051828 A2 (L'OREAL) 04 July 2002 (2002-07-04) the whole document	1-13
A	US 2022023183 A1 (L'OREAL) 27 January 2022 (2022-01-27) paragraphs 0104-0107	1-13
A	JP 2005211425 A (SANSHO SHIGYO K.K. et al.) 11 August 2005 (2005-08-11) the whole document	1-13



Further documents are listed in the continuation of Box C.



See patent family annex.

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“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

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Date of mailing of the international search report

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Name and mailing address of the ISA/CN

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INTERNATIONAL SEARCH REPORT
Information on patent family members

International application No.

PCT/CN2023/095217

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