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(54) Title: COMPOSITION FOR BRIGHTENING OR TONING THE SKIN

(57) Abstract: A composition for brightening or toning the skin in the form of a gel comprises, in a hydrophilic phase, i) at least one white particle; ii) at least one acrylic acid polymer; iii) at least one 2-acrylamido-2-methylpropanesulfonic acid (AMPS) polymer; and iv) glycerin. A cosmetic process for brightening or toning the skin comprises applying the composition to the skin.

WO 2023/212931 A1

COMPOSITION FOR BRIGHTENING OR TONING THE SKIN

TECHNICAL FIELD

The present invention relates to a cosmetic composition. In particular, the present invention relates to a composition for brightening or toning the skin, in particular human skin.

BACKGROUND ART

The colour of human skin colour depends on various factors, and in particular on the seasons of the year, on race and on gender; it is mainly determined by the nature and the concentration of melanin produced by melanocytes. Melanocytes are specialized cells which synthesize melanin by means of specific organelles, melanosomes. In addition, at various times in their life, certain individuals experience the appearance of dark and/or coloured spots on the skin and more especially on the hands, which give the skin heterogeneity.

For various reasons associated in particular with greater comfort of use (softness, emollience and the like), current compositions for caring for and/or making up keratin materials, in particular the skin, are usually in the form of an emulsion of the oil-in-water (O/W) type consisting of an aqueous dispersing continuous phase and an oily dispersed discontinuous phase, or of an emulsion of the water-in-oil (W/O) type consisting of an oily dispersing continuous phase and an aqueous dispersed discontinuous phase.

O/W emulsions are the ones most sought in the cosmetics field, since they comprise an aqueous phase as the external phase, which gives them, when applied to the skin, a fresher, less greasy and lighter feel than W/O emulsions.

However, due to their natural feature, the conventional oil-in-water emulsions are not totally satisfying, in particular in terms of brightening or toning of the skin.

Efforts have been made to introduce toning active agents into the oil-in-water emulsions. However, it is difficult to obtain a stable composition delivering a good brightening or toning on the skin.

Efforts have also been made to introduce toning pigments into the oil-in-water emulsions. Unfortunately, such pigments generally negatively impact the stability of the emulsions, thereby somewhat complicating the manufacture of the emulsion.

It is also desired that the product for brightening or toning the skin has a suitable viscosity so that there are no droplets falling from the consumer's hand and it is not difficult to apply the product when the product is applied on the skin.

Therefore, there is a need for formulating a composition for brightening or toning the skin, which can provide brightening or toning effect on the skin, and which has suitable viscosity and is stable.

SUMMARY OF THE INVENTION

An object of the present invention is to provide a composition for brightening or toning the skin, which can provide brightening or toning effect on the skin, and which has suitable viscosity and is stable.

Another object of the present invention is to provide a cosmetic process for brightening or toning the skin.

Thus, according to one aspect, the present invention provides a composition for brightening or toning the skin in the form of a gel, comprising, in a hydrophilic phase,

- i) at least one white particle;
 - ii) at least one acrylic acid polymer;
 - iii) at least one 2-acrylamido-2-methylpropanesulfonic acid (AMPS) polymer;
- and
- iv) glycerin.

Firstly, the composition according to the present invention has a brightening or toning effect to the skin, in particular human skin.

Secondly, the composition according to the present invention has a viscosity of from 4500 to 16000 mpa.s as determined with a Rheomat 100 Plus viscometer equipped with a spindle M4 at 25°C, so that there are no droplets falling from the consumer's hand and it is not difficult to apply the composition when the composition is applied on the skin.

In addition, the composition according to the present invention is stable over time.

According to another aspect, the present invention provides a cosmetic process for brightening or toning the skin, comprising applying the composition as defined above to the skin.

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 "ranging 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. Human skin, in particular skin of face, neck, back and hand is most particularly considered according to the present invention.

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

According to the first aspect, the composition in the form of a gel according to the present invention comprising, in a hydrophilic phase,

- i) at least one white particle;
 - ii) at least one at least one acrylic acid polymer;
 - iii) at least one 2-acrylamido-2-methylpropanesulfonic acid (AMPS) polymer;
- and
- iv) glycerin.

White particles

The cosmetic composition according to the present invention comprises at least one white particles .

The term "white" is intended to mean particles having the colour white and its derivatives (off-white, alabaster white, etc.), as opposed to primary colours and derivatives.

In some embodiment, the white particles used are inorganic particles.

In particular, the white particles have a lightness value L^* close to 100 in the CIE Lab76 system.

Preferably, the white particles is characterized by $0.3\text{ }\mu\text{m} < D50 < 40\text{ }\mu\text{m}$.

The volume average size (D50) is a parameter for particle size distribution, referring to the maximum particle diameter below which 50% of the sample volume exists (see in "A Basic Guide To Particle Characterization", page 10, published by Malvern Instruments Limited in 2012).

The volume average size (D50) of the particles may be measured by static light scattering using a commercial granulometer such as the MasterSizer 3000 machine from Malvern. The data are processed on the basis of the Mie scattering theory. This theory, which is exact for isotropic particles, makes it possible to determine, in the case of non-spherical particles, an "effective" particle diameter. This theory is especially described in the publication by Van de Hulst, H.C., "Light Scattering by Small Particles," Chapters 9 and 10, Wiley, New York, 1957.

The white particles according to the present invention have a continuous effect, which is controlled by the resolution capacity of the eye. Since said capacity is around $40\text{ }\mu\text{m}$, particles having a volume average size (D50) of less than $40\text{ }\mu\text{m}$, preferably less than $25\text{ }\mu\text{m}$ and even better still less than or equal to $6\text{ }\mu\text{m}$ are therefore considered. However, it is ensured that particles of which the D50 is greater than $0.3\text{ }\mu\text{m}$ and preferentially $0.5\text{ }\mu\text{m}$ are taken, so as not to have too great a loss of opacity, which would be extremely detrimental to the desired effect.

Thus, the composition of the present invention preferably comprises at least white particles having a volume size (D50) of less than $40\text{ }\mu\text{m}$, preferably between 0.3 and $25\text{ }\mu\text{m}$ and better still between 0.3 and $6\text{ }\mu\text{m}$, or even between 0.5 and $3\text{ }\mu\text{m}$.

These particles may be made of one material or else be composites. For example, these particles may be selected from boron nitride, silica, pearl, mica, synthetic mica, mica based pearl pigment particles, composite particles comprising titanium dioxide and a substrate selected from alumina, silica, barium sulfate, glass, mica and synthetic mica, or mixtures thereof.

According to a preferred embodiment, the particles are boron nitride particles.

According to another embodiment, the particles are composite particles comprising titanium dioxide and an alumina substrate.

According to another embodiment, the particles are composite particles comprising titanium dioxide and a mica substrate.

The white particles are advantageously boron nitride particles, preferentially having a volume average size of from 0.3 to 6 μm .

Preferably, the white particles according to the present invention have an average refractive index of between 1.4 and 2.2. This is because, if the particle has a refractive index above 2.2, the opacity of the composition is too high, and if this index is below 1.4, the lightening effect is not sufficient. The average refractive index is defined as being the sum of the refractive indices weighted by the weight content in the particle.

As examples of composite particles, mention may, for example, be made of platelets of mica (60%) covered with TiO_2 (40%), with an average refractive index of 1.9 ($0.6 \times 1.5 + 0.4 \times 2.5$); inclusions of titanium oxide (40%) in a matrix of alumina (60%), with an average refractive index of 1.96 ($0.6 \times 1.6 + 0.4 \times 2.5$).

The refractive indices of some materials are listed in Table 1:

Table 1

Material	Refractive index
Mica	1.4-1.7
Bismuth oxychloride	2.15
Fe_3O_4	2.4
TiO_2 (anatase)	2.5
TiO_2 (rutile)	2.7
Boron nitride	1.74
Alumina (amorphous)	1.6

By way of example of particles, mention may be made of boron nitride particles, such as PUHP1030L from Saint Gobain Ceramics and UHP-1010 from Carborundum.

According to one particularly preferred embodiment, use will be made of boron nitride particles having a volume average size D50 of less than 6 μm , such as the boron nitride particles sold under the name PUHP1030L by Saint Gobain Ceramics, having a volume average size of 3 μm .

Advantageously, the white particle is present in an amount ranging from 0.1 wt.% to 1 wt.%, preferably from 0.15 wt.% to 0.8 wt.%, more preferably from 0.2 wt.% to 0.7 wt.%, relative to the total weight of the composition.

Acrylic acid polymers

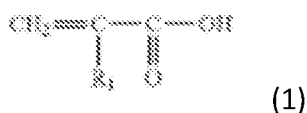
The composition of the present invention comprises at least one acrylic acid polymer.

The acrylic acid polymer is selected from acrylic acid homopolymers and copolymers containing one or more monomers selected from acrylic acid, substituted acrylic acids, and salts and esters of these acrylic acids and the substituted acrylic acids.

The term "copolymers" is understood to mean both copolymers obtained from two types of monomers and those obtained from more than two types of monomers, such as terpolymers obtained from three types of monomers.

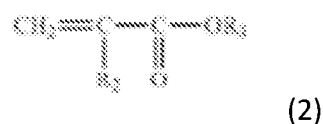
Their chemical structure more particularly comprises at least one hydrophilic unit and at least one hydrophobic unit. The term "hydrophobic group" or "hydrophobic unit" is intended to mean a radical possessing a saturated or unsaturated and linear or branched hydrocarbon chain comprising at least 8 carbon atoms, preferably from 10 to 30 carbon atoms.

Preferably, the acrylic acid polymer is selected from copolymers of:
at least one monomer of following formula (1):



in which R_1 denotes H or CH_3 or C_2H_5 , that is to say acrylic acid, methacrylic acid or ethacrylic acid monomers, and

at least one monomer of unsaturated carboxylic acid ($\text{C}_{10}\text{-C}_{30}$) alkyl ester type which corresponds to the monomer of following formula (2):



in which R_2 denotes H or CH_3 or C_2H_5 (that is to say, acrylate, methacrylate or ethacrylate units) and preferably H (acrylate units) or CH_3 (methacrylate units) and R_3 denotes a $\text{C}_{10}\text{-C}_{30}$ alkyl radical.

The $\text{C}_{10}\text{-C}_{30}$ alkyl esters of unsaturated carboxylic acids are preferably selected from lauryl acrylate, stearyl acrylate, decyl acrylate, isodecyl acrylate, dodecyl acrylate and the corresponding methacrylates, such as lauryl methacrylate, stearyl methacrylate, decyl methacrylate, isodecyl methacrylate and dodecyl methacrylate, and their mixtures.

Preferably, the acrylic acid polymer is crosslinked.

Use will more particularly be made, among the acrylic polymers of this type, of copolymers obtained from the polymerization of:

- (i) acrylic acid,
- (ii) an ester of formula (2) described above in which R_2 denotes H or CH_3 and R_3 denotes an alkyl radical having from 10 to 30 carbon atoms, and
- (iii) a crosslinking agent which is a well-known copolymerizable polyethylenic unsaturated monomer, such as diallyl phthalate, allyl (meth)acrylate, divinylbenzene, (poly)ethylene glycol dimethacrylate and methylenebisacrylamide.

Use will more particularly be made of those composed of 95wt % to 60wt % of acrylic acid (hydrophilic unit), 4wt % to 40wt % of C_{10} - C_{30} alkyl acrylate (hydrophobic unit) and 0 wt % to 6wt % of crosslinking polymerizable monomer or else of those composed of 98wt % to 96wt % of acrylic acid (hydrophilic unit), 1wt % to 4wt % of C_{10} - C_{30} alkyl acrylate (hydrophobic unit) and 0.1 wt % to 0.6wt % of crosslinking polymerizable monomer, such as those described above.

Preference is very particularly given according to the present invention, among the polymers above, to acrylate/ C_{10} - C_{30} alkyl acrylate copolymers (INCI name: Acrylates/ C_{10} -30 Alkyl Acrylate Crosspolymer). These copolymers are commercially available as Carbopol® 1342, Carbopol® 1382, Pemulen TR-1, and Pemulen TR-2, from B.F. Goodrich.

Advantageously, the acrylic acid polymer is present in amount ranging from 0.1 wt.% to 3 wt.%, preferably from 0.2 wt.% to 2 wt.%, more preferably from 0.3 wt.% to 1 wt.%, relative to the total weight of the composition.

AMPS polymers

The composition of the present invention comprises at least one 2-acrylamido-2-methylpropanesulfonic acid (AMPS) polymer.

The AMPS polymers can be crosslinked or non-crosslinked homopolymers or copolymers comprising at least acrylamido-2-methylpropanesulfonic acid monomer, optionally in a form partially or totally neutralized with ammonia, sodium hydroxide or potassium hydroxide. Representative AMPS polymers are those commercially available from THE LUBRIZOL CORPORATION under the name AMPS®.

AMPS polymers are preferably totally neutralized or virtually totally neutralized, i.e. at least 90% neutralized.

When the polymers are crosslinked, the crosslinking agents may be chosen from the polyolefinically unsaturated compounds commonly used for the crosslinking of polymers obtained by free-radical polymerization.

Examples of crosslinking agents that may be mentioned include divinylbenzene, diallyl ether, dipropylene glycol diallyl ether, polyglycol diallyl ethers, triethylene glycol divinyl ether, hydroquinone diallyl ether, ethylene glycol or tetraethylene glycol di(meth)acrylate, trimethylolpropane triacrylate, methylenebisacrylamide, methylenebismethacrylamide, triallylamine, triallyl cyanurate, diallyl maleate, tetraallylethylenediamine, tetraallyloxyethane, trimethylolpropane diallyl ether, allyl (meth)acrylate, allylic ethers of alcohols of the sugar series, or other allylic or vinyl ethers of polyfunctional alcohols, and also allylic esters of phosphoric and/or vinylphosphonic acid derivatives, or mixtures of these compounds.

Preferably, the crosslinking agent is chosen from methylenebisacrylamide, allyl methacrylate and trimethylolpropane triacrylate (TMPTA). The degree of crosslinking generally ranges from 0.01 mol% to 10 mol% and more particularly from 0.2 mol% to 2 mol% relative to the polymer.

The AMPS polymer in accordance with the invention is water-soluble or water-dispersible. In this case they are:

- either "homopolymers" comprising only AMPS monomers and, if they are crosslinked, one or more crosslinking agents such as those defined above;
- or copolymers obtained from AMPS and from one or more hydrophilic or hydrophobic ethylenically unsaturated monomers and, if they are crosslinked, one or more crosslinking agents such as those defined above. When the said copolymers comprise hydrophobic ethylenically unsaturated monomers, these monomers may not comprise a fatty chain and are preferably present in small amounts.

For the purposes of the AMPS polymer according to the present invention, the term "fatty chain" means any hydrocarbon-based chain containing at least 7 carbon atoms.

The term "water-soluble or water-dispersible" means polymers which, when introduced into an aqueous phase at 25°C, to a mass concentration equal to 1%, make it possible to obtain a macroscopically homogeneous and transparent solution, i.e. a solution that has a maximum light transmittance value, at a wavelength equal to 500 nm, through a sample 1 cm thick, of at least 60% and preferably of at least 70%.

The "homopolymers" according to the invention are preferably crosslinked and neutralized.

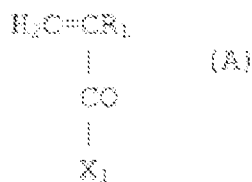
The AMPS homopolymers according to the invention are preferably optionally crosslinked and/or neutralized 2-acrylamido-2-methylpropanesulfonic acid homopolymers, for instance the poly(2-acrylamido-2-methylpropanesulfonic acid) sold by the company Clariant under the name Hostacerin AMPS® (CTFA name: ammonium polyacryldimethyltauramide).

The water-soluble or water-dispersible AMPS copolymers according to the invention contain water-soluble ethylenically unsaturated monomers, hydrophobic monomers or mixtures thereof.

The water-soluble comonomers may be ionic or nonionic.

Among the ionic water-soluble comonomers, examples that may be mentioned include the following compounds and the salts thereof:

- (meth)acrylic acid,
- styrenesulfonic acid,
- vinylsulfonic acid and (meth)allylsulfonic acid,
- vinylphosphonic acid,
- maleic acid,
- itaconic acid,
- crotonic acid,
- the water-soluble vinyl monomers of formula (A) below:



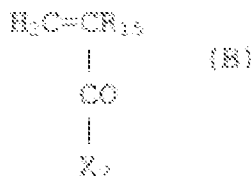
in which:

- R_1 is chosen from H, $-\text{CH}_3$, $-\text{C}_2\text{H}_5$ and $-\text{C}_3\text{H}_7$
- X_1 is chosen from alkyl ethers of $-\text{OR}_2$ type in which R_2 is a linear or branched, saturated or unsaturated hydrocarbon-based radical containing from 1 to 6 carbon atoms, substituted with at least one sulfonic ($-\text{SO}_3^-$) and/or sulfate ($-\text{SO}_4^-$) and/or phosphate ($-\text{PO}_4\text{H}_2^-$) group.

Among the nonionic water-soluble comonomers, examples that may be mentioned include:

- (meth)acrylamide,
- N-vinylacetamide and N-methyl-N-vinylacetamide,
- N-vinylformamide and N-methyl-N-vinylformamide,

- maleic anhydride,
- vinylamine,
- N-vinyl lactams comprising a cyclic alkyl group containing 4 to 9 carbon atoms, such as n-vinylpyrrolidone, N-butylolactam and N-vinylcaprolactam,
- vinyl alcohol of formula $\text{CH}_2=\text{CHOH}$,
- the water-soluble vinyl monomers of formula (B) below:



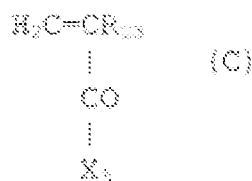
in which:

- R_{15} is chosen from H, $-\text{CH}_3$, $-\text{C}_2\text{H}_5$ and $-\text{C}_3\text{H}_7$
- X_2 is chosen from alkyl ethers of $-\text{OR}_{16}$ type in which R_{16} is a linear or branched, saturated or unsaturated hydrocarbon-based radical containing from 1 to 6 carbons, optionally substituted with a halogen atom (iodine, bromine, chlorine or fluorine); a hydroxyl group ($-\text{OH}$); ether.

Mention is made, for example, of glycidyl (meth)acrylate, hydroxyethyl methacrylate and (meth)acrylates of ethylene glycol, of diethylene glycol or of polyalkylene glycol.

Among the fatty-chain-free hydrophobic comonomers, examples that may be mentioned include:

- styrene and its derivatives, such as 4-butylstyrene, α -methylstyrene and vinyltoluene,
- vinyl acetate of formula $\text{CH}_2=\text{CH}-\text{OCOCH}_3$;
- vinyl ethers of formula $\text{CH}_2=\text{CHOR}$ in which R is a linear or branched, saturated or unsaturated hydrocarbon-based radical containing from 1 to 6 carbons;
- acrylonitrile,
- caprolactone,
- vinyl chloride and vinylidene chloride,
- silicone derivatives, which lead to silicone polymers after polymerization, such as methacryloxypropyltris(trimethylsiloxy)silane and silicone methacrylamides,
- the hydrophobic vinyl monomers of formula (C) below:



in which:

- R_{23} is chosen from H, $-\text{CH}_3$, $-\text{C}_2\text{H}_5$ and $-\text{C}_3\text{H}_7$

- X_3 is chosen from:

- alkyl ethers of $-\text{OR}_{24}$ type in which R_{24} is a linear or branched, saturated or unsaturated hydrocarbon-based radical containing from 1 to 6 carbon atoms.

Mention is made, for example, of methyl methacrylate, ethyl methacrylate, n-butyl (meth)acrylate, tert-butyl (meth)acrylate, cyclohexyl acrylate and isobornyl acrylate and 2-ethylhexyl acrylate.

The AMPS polymer of the invention preferably have a molar mass ranging from 50 000 g/mol to 10 000 000 g/mol, preferably from 80 000 g/mol to 8 000 000 g/mol and even more preferably from 100 000 g/mol to 7 000 000 g/mol.

Examples of water-soluble or water-dispersible AMPS homopolymers in accordance with the invention that may be mentioned include crosslinked or non-crosslinked polymers of sodium acrylamido-2-methylpropanesulfonate, such as the polymer used in the commercial product Simulgel[®] 800 (CTFA name: Sodium Polyacryloyldimethyltaurate); or ammonium polyacryloyldimethyltaurate. For example, crosslinked AMPS copolymer is Aristoflex[®] HMS, ammonium acryloyldimethyltaurate/steareth-25 methacrylate crosspolymer; non-crosslinked AMPS copolymer is Aristoflex[®] SNC, ammonium acryloyldimethyltaurate/steareth-8 methacrylate copolymer.

Examples of water-soluble or water-dispersible AMPS copolymers in accordance with the invention that may be mentioned include:

- acrylamide/sodium acrylamido-2-methylpropanesulfonate crosslinked copolymers, such as the copolymer used in the commercial product Sepigel[®] 305 (CTFA name: Polyacrylamide/ C_{13} - C_{14} Isoparaffin/Laureth-7) or the copolymer used in the commercial product sold under the trade name Simulgel[®] 600 (CTFA name: Acrylamide/Sodium Acryloyldimethyltaurate/ Isohexadecane/ Polysorbate- 80) by the company SEPPIC;

- copolymers of AMPS and of vinylpyrrolidone or of vinylformamide, such as the copolymer used in the commercial product sold under the name Aristoflex[®] AVC by the company Clariant (CTFA name: Ammonium

Acryloyldimethyltaurate/VP Copolymer) but neutralized with sodium hydroxide or potassium hydroxide;

- copolymers of AMPS and of sodium acrylate, for instance AMPS/sodium acrylate copolymer such as the copolymer used in the commercial product sold under the name Simulgel[®] EG by the company SEPPIC (CTFA name: Acrylamide/Sodium Acryloyldimethyltaurate/ Isohexadecane/Polysorbate-80);

- copolymers of AMPS and of hydroxyethyl acrylate, for instance AMPS/hydroxyethyl acrylate copolymer, such as the copolymer used in the commercial product sold under the name Simulgel[®] NS by the company SEPPIC (CTFA name: Hydroxyethyl acrylate/Sodium Acryloyldimethyltaurate copolymer (and) Squalane (and) Polysorbate-60);

- ammonium acryloyldimethyltaurate/steareth-25 methacrylate crosspolymer.

The preferred polymers are more particularly sodium acrylamido-2-methylpropanesulfonate homopolymer, such as the homopolymer used in the commercial product Sepigel[®] 800, or ammonium polyacryloyldimethyl taurate; and AMPS/hydroxyethyl acrylate copolymers, such as the copolymer used in the commercial product sold under the name Simulgel NS, or ammonium acryloyldimethyltaurate/steareth-25 methacrylate crosspolymer.

Advantageously, the AMPS polymer is present in an amount ranging from 0.1 wt. % to 1.5 wt. %, preferably from 0.2 wt. % to 1 wt. %, more preferably from 0.3 wt. % to 0.7 wt.%, relative to the total weight of the composition.

Glycerin

According to the first aspect, the composition according to the present invention comprises glycerin.

Advantageously, glycerin is present in an amount ranging from 25 wt.% to 80 wt.%, preferably from 25 wt.% to 60 wt.%, more preferably from 30 wt.% to 50 wt.%, relative to the total weight of the composition.

For the purpose of the present invention, preferably, the weight ratio of the AMPS polymer to glycerin is between 1:200 and 1:20, preferably between 1:150 and 1:40.

Additional polyols

Preferably, the composition according to the present invention comprises further comprises at least one additional polyol other than glycerin.

Preferably, the composition according to the present invention comprises an additional polyol other than glycerin comprising 2-10 carbon atoms, for example at least one glycol, such as propylene glycol, dipropylene glycol, ethylene glycol, butylene glycol, and pentylene glycol.

In some embodiments, the composition according to the present invention comprises at least one additional polyol selected from propylene glycol, dipropylene glycol, ethylene glycol, butylene glycol, pentylene glycol, and a combination thereof.

In a very preferred embodiment, the composition according to the present invention comprises propylene glycol and dipropylene glycol.

Advantageously, if presents, the additional polyol other than glycerin is present in an amount ranging from 10 wt.% to 60 wt.%, preferably from 15 wt.% to 45 wt.%, more preferably from 18 wt.% to 35 wt.%, relative to the total weight of the composition.

With the presence of the additional polyol other than glycerin, the composition according to the present invention can deliver a fresh feeling to the skin.

For the purpose of the present invention, preferably, the weight ratio of the acrylic acid polymer to the additional polyol other than glycerin is between 1:200 and 1:20, preferably between 1:150 and 1:30.

Additional active ingredients

In addition to the white particle, the composition according to the present invention may comprise an additional active ingredient commonly used in cosmetic field.

According to some embodiments, the composition of the present invention comprises at least one additional active ingredient having an effect on the skin, such antioxidants such as ascorbic acid and polygonum cuspidatum root extract, free-radical scavengers such as ferulic acid, moisturizers, liporegulators, anti-acne agents, antiseborrhoeic agents, anti-ageing agents, softeners, anti-wrinkle agents, anti-inflammatories, refreshing agents, cicatrizing agents, vascular protective agents, antibacterials, antifungals, exfoliating agents, antiperspirants, deodorants, skin conditioners, desensitizing agents, immunomodulators and nourishing agents, moisture absorbers, soothing active ingredients and sebum absorbing ingredients.

Preferably, the additional active ingredient contained in the composition according to the present invention is water-soluble.

The additional active ingredients and the concentrations thereof can be adjusted based on the desired properties of the composition of the present

invention.

Adjuvants

In a known manner, the composition of the present invention may also contain one or more additional adjuvants that are common in cosmetics or dermatology.

Examples of additional adjuvants that may be mentioned include preservative agents, pH-adjusting agents, fragrances, pigments, and mixtures thereof.

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

According to a preferred embodiment, the present invention provides a composition for brightening or toning the skin in the form of a gel, comprising, in a hydrophilic phase, relative to the total weight of the composition,

- i) from 0.1 wt.% to 1 wt.% of boron nitride;
- ii) from 0.3 wt.% to 1 wt.% of acrylate/C₁₀-C₃₀ alkyl acrylate copolymer;
- iii) from 0.3 wt.% to 0.7 wt.% of at least one 2-acrylamido-2-methylpropanesulfonic acid (AMPS) polymer selected from acrylamido-2-methylpropanesulfonate homopolymer, ammonium polyacryloyldimethyl taurate, AMPS/hydroxyethyl acrylate copolymer, ammonium acryloyldimethyltaurate/stearate-25 methacrylate crosspolymer, and a combination thereof;
- iv) from 30 wt.% to 50 wt.% of glycerin; and
- v) from 18 wt.% to 35 wt.% of at least one additional polyol selected from propylene glycol, dipropylene glycol, ethylene glycol, butylene glycol, pentylene glycol, and a combination thereof.

The composition according to the present invention may be anhydrous.

By "anhydrous", it means that no water is added on purpose and the water content of the composition is less than 2 wt.%, preferably less than 0.5 wt. %, particularly less than 0.1 wt. %, relative to the total weight of the composition. In particular, there is no water in the composition.

The composition according to the present invention may not comprise any surfactant.

Method and use

The composition according to the present invention is intended for topical application and can especially constitute a composition intended for brightening or toning the skin, and especially human skin

According to another aspect, the present invention relates to a cosmetic process for brightening or toning the skin, comprising applying the composition as defined above to the skin.

In particular, the skin is human skin.

The present invention is illustrated in greater detail by the examples described below, which are given as non-limiting illustrations.

In the examples that follow, the weight percentages are indicated relative to the total weight of the cosmetic composition.

Examples

Main raw materials used, trade names and supplier thereof are listed in Table 2.

Table 2

INCI Name	Trade Name	Supplier
Glycerin	CREMERGLYC REFINED GLYCERINE 99,7% RSPO MB	CREMER OLEO (IOI)
Ascorbic acid	ASCORBIC ACID (L)	RECKON ORGANICS
Dipropylene glycol	DIPROPYLENE GLYCOL LO+	DOW
Ferulic acid	ORYZA FERULIX	ORYZA OIL & FAT CHEMICAL
Polygonum cuspidatum root extract	POLYGONUM CUSPIDATUM ROOT EXTRACT	GUILIN LAYN NATURAL INGREDIENTS
Propylene glycol	1,2-PROPYLENEGLYCOL CARE	BASF
Boron nitride	SP2	SAINT GOBAIN CERAMICS
Ammonium polyacryloyldimethyl taurate	HOSTACERIN AMPS	CLARIANT
Acrylates/C10-30 alkyl acrylate crosspolymer	CARBOPOL ULTREZ 21 POLYMER	LUBRIZOL
Silica silylate	FINE PARTICLE AEROGEL TLD201	CABOT
Poloxamer 338	SYNPERONIC PE/F 108-NAA-FL-(CQ)	CRODA
Xanthan gum	KELTROL® CG-T	CP KELCO
Tween 20	SP TWEEN 20 MBAL-LQ-(CQ)	CRODA

Invention examples 1-5 and comparative examples 1-6

Compositions of invention examples (IE.) 1-5 and comparative examples (CE.) 1-6 were prepared according to the amounts given in Table 3. The amount of each component is given in % by weight of the total weight of the composition containing it.

Table 3

Components	Ex. 1	Ex. 2	Ex. 3	Ex.4	Ex.5	CE. 1	CE. 2	CE. 3	CE. 4	CE. 5	CE. 6
Glycerin	43.47	43.27	43.07	42.57	42.07	43.14	42.07	43.14	42.07	42.07	42.07
Ascorbic acid	12.63	12.63	12.63	12.63	12.63	12.63	12.63	12.63	12.63	12.63	12.63
Dipropylene glycol	17.1	17.1	17.1	17.1	17.1	17.1	17.1	17.1	17.1	17.1	17.1
Ferulic acid	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9
Polygonum cuspidatum root extract	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5
Propylene glycol	23.5	23.5	23.5	23.5	23.5	23.5	23.5	23.5	23.5	23.5	23.5
Boron nitride	0.3	0.5	0.5	0.5	0.3	0.3	0.3	0.3	0.3	0.3	0.3
Ammonium polyacryloyl-dimethyl taurate	0.3	0.3	0.3	0.3	0.5	0.3	1	0.3	1	1	1
Acrylates/C10-30 alkyl acrylate crosspolymer	0.3	0.3	0.5	1	0.3	-	-	-	-	-	-
Silica silylate	-	-	-	-	-	1	1	-	-	-	-
Poloxamer 338	-	-	-	-	-	-	-	1	1	-	-
Xanthan gum	-	-	-	-	-	-	-	-	-	1	-
Tween 20	-	-	-	-	-	-	-	-	-	-	1

Compositions of comparative invention 1-2 comprise silica silylate instead of acrylic acid polymer.

Compositions of comparative invention 3-4 comprise poloxamer 338 instead of acrylic acid polymer.

Composition of comparative invention 5 comprises xanthan gum instead of acrylic acid polymer.

Composition of comparative invention 6 comprises Tween 20 instead of acrylic acid polymer.

Preparation process:

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

1). mixing glycerin, dipropylene glycol, and propylene glycol and heating the mixture to 80°C;

- 2). adding ammonium polyacryloyldimethyl taurate and acrylates/C10-30 alkyl acrylate crosspolymer into the mixture with stirring;
- 3). add the remaining ingredients to obtain the composition.

Evaluation

Each composition of invention examples 1-5 and comparative examples 1-6 was evaluated in terms of viscosity and stability.

Viscosity

The viscosity was measured at 25°C, using a Rheomat 100 Plus viscometer equipped with a spindle M4, the measurement being performed after 10 minutes of rotation of the spindle in a sample (after which time stabilization of the viscosity and of the spin speed of the spindle are observed), at a shear rate of 200 rpm.

Stability

The stability was evaluated as follows:

- 1) filling 40 mL of a sample into a 60 mL glass bottle and preparing six bottles for each composition to be tested;
- 2) putting one bottle under the sun (for sun-test), one bottle at room temperature (RM, 20 °C), one bottle into a refrigerator at 4°C, one bottle into an oven at 37 °C, and one bottle into an oven at 45 °C (for stability tests at different temperatures), and one bottle into an oven with the temperature cycling from -20 °C to 20 °C for every 24 hours (for cycle stability); and
- 3) observing the samples' appearance after 24 hours for the sun-test, 2 months for stability tests at different temperatures or 10 days for cycle stability.

The stability will be evaluated as PASS if the composition remains a uniform gel after all of the stability tests at different temperature and that cycle stability test, otherwise, it will be evaluated as FAILED.

The viscosity and stability of the compositions according to comparative examples and inventive examples were listed in Table 4.

Table 4

Properties		Ex. 1	Ex. 2	Ex. 3	Ex.4	Ex.5	CE.1	CE.2	CE.3	CE.4	CE.5	CE.6
Viscosity (*10 ³ mpa.s)		8.25	8.25	9.3	15	12.	16.5	15	19	15.5	8	8
Stability	under the sun	PASS					Failed					
	RM	PASS					Failed					
	4°C	PASS					PASS					
	37 °C	PASS					FAILED					
	45 °C	PASS					FAILED					
	cycle	PASS					FAILED					

It can be also seen that the composition according to the present invention has a suitable viscosity for topical application and is stable.

In addition, the composition of invention examples 1-5 can deliver a brightening or toning effect to the skin.

CLAIMS

1. A composition for brightening or toning the skin in the form of a gel, comprising, in a hydrophilic phase,

- i) at least one white particle;
- ii) at least one acrylic acid polymer;
- iii) at least one 2-acrylamido-2-methylpropanesulfonic acid (AMPS) polymer;

and

- iv) glycerin.

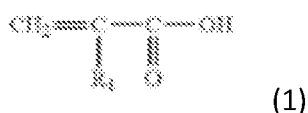
2. Composition of claim 1, wherein the white particles are selected from boron nitride, silica, pearl, mica, synthetic mica, mica based pearl pigment particles, composite particles comprising titanium dioxide and a substrate selected from alumina, silica, barium sulfate, glass, mica and synthetic mica, or mixtures thereof.

3. Composition of claim 1 or 2, wherein the white particles are present in the composition in an amount ranging from 0.1 wt.% to 1 wt.%, preferably from 0.15 wt.% to 0.8 wt.%, more preferably from 0.2 wt.% to 0.7 wt.%, relative to the total weight of the composition.

4. Composition of any one of claims 1 to 3, wherein the acrylic acid polymer is selected from acrylic acid homopolymers and copolymers containing one or more monomers selected from acrylic acid, substituted acrylic acids, and salts and esters of these acrylic acids and the substituted acrylic acids.

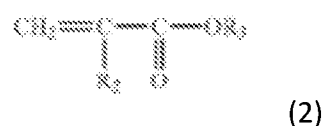
5. Composition of any one of claims 1 to 4, wherein the acrylic acid polymer is selected from copolymers of:

at least one monomer of following formula (1):



in which R₁ denotes H or CH₃ or C₂H₅, and

at least one monomer of unsaturated carboxylic acid (C₁₀-C₃₀) alkyl ester type which corresponds to the monomer of following formula (2):



in which R₂ denotes H or CH₃ or C₂H₅ and R₃ denotes a C₁₀-C₃₀ alkyl radical, preferably, the acrylic acid polymer is selected from copolymers obtained from the polymerization of:

(i) acrylic acid,

(ii) an ester of formula (2) described above in which R_2 denotes H or CH_3 and R_3 denotes an alkyl radical having from 10 to 30 carbon atoms, and

(iii) a crosslinking agent selected from diallyl phthalate, allyl (meth)acrylate, divinylbenzene, (poly)ethylene glycol dimethacrylate and methylenebisacrylamide, more preferably, the acrylic acid polymer is acrylate/ C_{10} - C_{30} alkyl acrylate copolymers.

6. Composition according to any one of claims 1 to 5, wherein the acrylic acid polymer is present in amount ranging from 0.1 wt.% to 3 wt.%, preferably from 0.2 wt.% to 2 wt.%, more preferably from 0.3 wt.% to 1 wt.%, relative to the total weight of the composition.

7. Composition according to any of claims 1 to 6, wherein the AMPS polymer is selected from crosslinked or non-crosslinked homopolymers or copolymers comprising at least acrylamido-2-methylpropanesulfonic acid monomer, optionally in a form partially or totally neutralized with ammonia, sodium hydroxide or potassium hydroxide.

8. Composition according to any of claims 1 to 7, wherein the AMPS polymer is selected from sodium acrylamido-2-methylpropanesulfonate homopolymer, or ammonium polyacryloyldimethyl taurate homopolymer, AMPS/hydroxyethyl acrylate copolymer, or ammonium acryloyldimethyltaurate/steareth-25 methacrylate crosspolymer.

9. Composition according to any of claims 1 to 8, wherein the AMPS polymer is present in an amount ranging from 0.1 wt. % to 1.5 wt. %, preferably from 0.2 wt. % to 1 wt. %, more preferably from 0.3 wt. % to 0.7 wt.%, relative to the total weight of the composition.

10. Composition according to any of claims 1 to 9, wherein glycerin is present in an amount ranging from 25 wt.% to 80 wt.%, preferably from 25 wt.% to 60 wt.%, more preferably from 30 wt.% to 50 wt.%, relative to the total weight of the composition.

11. Composition according to any of claims 1 to 10, further comprising an additional polyol other than glycerin comprising 2-10 carbon atoms, preferably, the additional polyol is selected from propylene glycol, dipropylene glycol, ethylene glycol, butylene glycol, pentylene glycol, and a combination thereof.

12. Composition according to claim 11, wherein the additional polyol other than glycerin is present in an amount ranging from 10 wt.% to 60 wt.%, preferably from 15 wt.% to 45 wt.%, more preferably from 18 wt.% to 35 wt.%, relative to the total weight of the composition.

13. Composition according to any of claims 1 to 11, wherein the composition is anhydrous.

14. Composition according to any of claims 1 to 13, comprising, in a hydrophilic phase, relative to the total weight of the composition,

- i) from 0.1 wt.% to 1 wt.% of boron nitride;
- ii) from 0.3 wt.% to 1 wt.% of acrylate/C₁₀-C₃₀ alkyl acrylate copolymer;
- iii) from 0.3 wt.% to 0.7 wt.% of at least one 2-acrylamido-2-methylpropanesulfonic acid (AMPS) polymer selected from acrylamido-2-methylpropanesulfonate homopolymer, ammonium polyacryloyldimethyl taurate, AMPS/hydroxyethyl acrylate copolymer, ammonium acryloyldimethyltaurate/stearate-25 methacrylate crosspolymer, and a combination thereof;
- iv) from 30 wt.% to 50 wt.% of glycerin; and
- v) from 18 wt.% to 35 wt.% of at least one additional polyol selected from propylene glycol, dipropylene glycol, ethylene glycol, butylene glycol, pentylene glycol, and a combination thereof.

15. A cosmetic process for brightening or toning the skin, comprising applying the composition according to any of claims 1 to 14 to the skin.

INTERNATIONAL SEARCH REPORT

International application No.

PCT/CN2022/091214

A. CLASSIFICATION OF SUBJECT MATTER

A61K 8/06(2006.01)i; A61K 8/19(2006.01)i; A61K 8/25(2006.01)i; A61K 8/26(2006.01)i; A61K 8/29(2006.01)i; A61K 8/42(2006.01)i; A61K 8/81(2006.01)i; A61K 8/72(2006.01)i; A61Q 1/02(2006.01)i; A61Q 19/00(2006.01)i

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

B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)

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)

WPABSC;CNTXT;WPABS;ENTXT;CJFD;DWPI;ENTXTC;VEN; CNMED;CPRSABS;EPTXT;CNABS; TWMED;CHTXT; TWTXT;TWABS;HKABS;MOABS;LEXTXT;CATXT;USTXT;GBTXT;WOTXT;SGTXT; FRABS;JPABS;ILABS;RUABS; DEABS;SIPOABS;SGABS;AUABS;KRTXT;JPTXT;DETXT;CNKI; bright+,toning, skin, gel, particle, 2-acrylamido-2-methylpropanesulfonic acid, AMPS, glycerin.

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	WO 2020132855 A1 (OREAL et al.) 02 July 2020 (2020-07-02) claims 13 and 14, description, example 1, Inv. 2, page 22, lines 21-24	1-15
X	WO 2019159726 A1 (OREAL et al.) 22 August 2019 (2019-08-22) claims 1 and 2	1-15
A	US 2021220235 A1 (OREAL) 22 July 2021 (2021-07-22) claims 1-13	1-15
A	US 2007166248 A1 (OREAL) 19 July 2007 (2007-07-19) claims 1-25	1-15
A	CN 110709050 A (OREAL) 17 January 2020 (2020-01-17) claims 1-12	1-15

☐ Further documents are listed in the continuation of Box C.

☒ See patent family annex.

* Special categories of cited documents:

“A” document defining the general state of the art which is not considered to be of particular relevance
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 “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
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 “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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Name and mailing address of the ISA/CN

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INTERNATIONAL SEARCH REPORT
Information on patent family members

International application No.

PCT/CN2022/091214

Patent document cited in search report			Publication date (day/month/year)	Patent family member(s)			Publication date (day/month/year)
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				JP	2019142793	A	29 August 2019
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				WO	2020000283	A1	02 January 2020
				EP	3829523	A1	09 June 2021
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CN	110709050	A	17 January 2020	EP	3621576	A1	18 March 2020
				ES	2906277	T3	18 April 2022
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				FR	3066107	A1	16 November 2018