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(54) Title: TRANSPARENT COSMETIC COMPOSITION WITH ASCORBIC ACID AND WATER-SOLUBLE UV SCREENING AGENT

(57) Abstract: A subject of the present invention is a cosmetic composition comprising: - at least 30% by weight of water, with respect to the total weight of the composition, - at least 5% by weight of ascorbic acid, with respect to the total weight of the composition, - at least one water-soluble UV screening agent chosen from bis-benzazoly derivatives, benzimidazole derivatives comprising at least one sulfonic radical, p-aminobenzoic acid derivatives and their mixtures, preferably chosen from benzimidazole derivatives comprising at least one sulfonic radical, said composition having a pH of between 5 and 7, preferably between 5.5 and 6.5. Another subject of the invention is a cosmetic method for caring for keratin materials using this composition.



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DESCRIPTION

TITLE: Transparent cosmetic composition with ascorbic acid and water-soluble UV screening agent

The present invention relates to a transparent aqueous cosmetic composition, comprising ascorbic acid and at least one water-soluble UV screening agent preferably chosen from benzimidazole derivatives comprising at least one sulfonic radical.

Preferably, the present invention relates to a transparent aqueous cosmetic composition comprising ascorbic acid, at least one water-soluble UVB screening agent chosen from benzimidazole derivatives comprising at least one sulfonic radical and at least one cationic polymer chosen from cationic galactomannan gums and cationic cellulose polymers modified by groups comprising at least one linear fatty chain.

In cosmetic applications, it is common to add ascorbic acid (vitamin C) as active principle which regenerates the skin, by virtue of the stimulation of the synthesis of collagen responsible for the firmness of the skin, or also depigmenting agent, as this vitamin reduces the production of melanin responsible for liver spots. Ascorbic acid is also known for its antioxidant properties.

However, when ascorbic acid is introduced into an aqueous medium (such as emulsions or serums) at high contents (i.e., for example, greater than 1% by weight, preferably greater than 5% by weight), it is difficult to formulate it as it destabilizes and changes drastically in color. This change in color can range up to a brown coloration, which is totally unacceptable to the consumer.

This is why there are found, on the market, aqueous compositions of serum or solution type which comprise ascorbic acid in the form of a powder to be dissolved at the time of use. The disadvantage of products of this type is that the vitamin C ends up by decomposing in the aqueous medium. These products thus lose their attractiveness as consumers prefer, for reasons of practicality, serums without prior handling, with the guarantee of stability of color and without chemical decomposition. Consumers also prefer a product of low capacity (for example 10 ml), which makes rapid use possible.

There thus exists a need for an aqueous cosmetic composition comprising ascorbic acid which is stable, i.e. which remains of the same color as at the start (generally white) and of the same texture, and which does not decompose the active principle.

Surprisingly, the Applicant Company has demonstrated that water-soluble UV screening agents, preferably benzimidazole derivatives comprising at least one sulfonic radical, make it possible to limit the degradation of the color of the compositions comprising ascorbic acid, over time and at temperature, while retaining the stability of the compositions which are obtained.

Thus, the present invention relates to a cosmetic composition comprising:

- at least 30% by weight of water, with respect to the total weight of the composition,
 - at least 5% by weight of ascorbic acid, with respect to the total weight of the composition,
 - at least one water-soluble UV screening agent chosen from bis-benzazolyli derivatives, benzimidazole derivatives comprising at least one sulfonic radical, p-aminobenzoic acid derivatives and their mixtures, preferably at a content of at least 0.1% by weight of active material, with respect to the total weight of the composition,
- said composition having a pH of between 5 and 7.

Preferably, the present invention relates to a cosmetic composition comprising:

- at least 30% by weight of water, with respect to the total weight of the composition,
 - at least 5% by weight of ascorbic acid, with respect to the total weight of the composition,
 - at least one water-soluble UV screening agent chosen from benzimidazole derivatives comprising at least one sulfonic radical; preferably, the water-soluble UV screening agent(s) is(are) at a content of at least 0.1% by weight of active material, with respect to the total weight of the composition,
 - at least one cationic polymer chosen from cationic galactomannan gums and cationic cellulose polymers modified by groups comprising at least one linear fatty chain,
- said composition having a pH of between 5 and 7.

More preferentially,

the present invention relates to a cosmetic composition comprising:

- at least 30% by weight of water, with respect to the total weight of the composition,
- at least 5% by weight of ascorbic acid, with respect to the total weight of the composition,
- at least 0.1% by weight of active material of a water-soluble UV screening agent chosen from benzimidazole derivatives comprising at least one sulfonic radical,

- at least one cationic polymer chosen from cationic galactomannan gums and cationic cellulose polymers modified by groups comprising at least one linear fatty chain, and
 - at least one sugar alcohol, preferably maltitol and/or sorbitol,
- said composition having a pH of between 5 and 7.

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The invention also relates to a cosmetic method for caring for keratin materials, preferably the skin, comprising the application, to said keratin materials, of a composition according to the invention.

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Preferably, the composition according to the invention is an aqueous solution, more preferentially an aqueous solution with a slightly gelled appearance. Preferably, the composition according to the invention is a single-phase composition. This composition can be referred to as "serum". The term "serum" is understood to mean a composition of fluid texture, of slightly gelled appearance, which is runny, and preferably concentrated in

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ascorbic acid (i.e. preferably at least 5% by weight of ascorbic acid).

Preferably, the composition according to the invention is substantially devoid of surfactants. The term "substantially devoid of surfactants" is understood to mean that the composition according to the invention exhibits a content of surfactants of less than or equal to 2% by

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weight, with respect to the total weight of the composition, preferably of less than or equal to 1% by weight. The surfactants can preferentially be peptizing agents, the concentration of which is between 0.1% and 2% by weight; they make possible the dissolution of a small amount of oil(s) or of lipophilic compounds or of fragrance(s) (i.e. concentration of fragrance(s) or oil(s) or lipophilic compound(s) of between 0.05% and 2%).

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Aqueous phase

The composition according to the invention comprises water, which constitutes the aqueous phase.

30

The water used can be sterile demineralized water and/or a floral water, such as rose water, cornflower water, camomile water or lime water, and/or a natural thermal or mineral water.

The composition preferably comprises at least 30% by weight of water, with respect to the total weight of the composition.

The composition preferably comprises from 30% to 93% by weight of water, with respect to the total weight of the composition, more preferentially from 50% to 90%, more preferentially still from 55% to 70%.

- 5 The aqueous phase can also comprise at least one organic solvent which is soluble in water, at 25°C.

Preferably, the water-soluble organic solvent is chosen from alcohols, polyols and their mixtures.

- 10 Mention may be made, among the alcohols, of C₁-C₁₀ alcohols, more preferentially C₁-C₅ alcohols, such as ethanol, isopropanol, propanol and butanol.

- The polyol is preferably chosen from polyols having from 2 to 20 carbon atoms, more preferentially from 2 to 6 carbon atoms, such as glycerol, diglycerol, propylene glycol, isoprene glycol, dipropylene glycol, butylene glycol, hexylene glycol, 1,3-propanediol, 15 pentylene glycol, polyethylene glycols having from 2 to 200 ethylene oxide units and their mixtures.

Preferably, the water-soluble organic solvent is chosen from polyols, preferably glycerol and/or hexylene glycol and/or pentylene glycol.

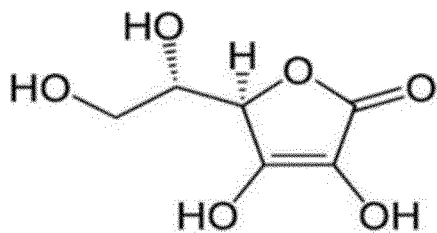
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Preferably, the composition comprises from 1% to 25% by weight of water-soluble organic solvent, with respect to the total weight of the composition, more preferentially from 2% to 30% by weight, more preferentially still from 5% to 20% by weight.

- 25 Ascorbic acid

The ascorbic acid within the meaning of the invention preferably corresponds to L-ascorbic acid, or vitamin C. It has the structure of the formula (I):

[Chem 1]



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The composition comprises at least 5% by weight of ascorbic acid, with respect to the total weight of the composition, more preferentially at least 7% by weight.

Preferably, the composition comprises from 5% to 30% by weight of ascorbic acid, with respect to the total weight of the composition, more preferentially from 7% to 20% by weight.

As shown in the examples, surprisingly, the compositions according to the invention are completely transparent, comprise in particular 10% or 12% by weight of ascorbic acid, and exhibit a good chemical stability and an acceptable change in color after 2 months at 45°C, comprising 2-phenylbenzimidazole-5-sulfonic acid. This change in color is acceptable because, graded on a color scale ranging from 0 (white, very light) to 9 (black, very dark), the compositions according invention have a grade of from 3.5 to 4, and this grade is lower than that of the reference composition comprising 10% by weight of ascorbic acid in water (graded 4.5, thus greater than 4).

Water-soluble UV screening agent

The composition according to the invention comprises at least one water-soluble UV screening agent, that is at least one water-soluble screening agent capable of absorbing UVA rays and at least one water-soluble screening agent capable of absorbing UVB rays, which is chosen from bis-benzazoyl derivatives, benzimidazole derivatives comprising at least one sulfonic radical, p-aminobenzoic acid derivatives and their mixtures.

The term "water-soluble screening agent" is understood to mean any inorganic or organic screening agent capable of being completely dissolved in molecular form in an aqueous liquid phase or of being dissolved in colloidal form (for example in micellar form) in an aqueous liquid phase.

Water-soluble screening agents capable of absorbing UV rays from 320 to 400 nm (UVA)

Mention may be made, among the water-soluble screening agents capable of absorbing UVA rays according to the invention, of:

- bis-benzazoyl derivatives such as described in EP 669 323 and US 2 463 264 and more particularly the compound Disodium Phenyl Dibenzimidazole Tetrasulfonate sold under the trade name Neo Heliopan AP by Haarmann & Reimer.

Water-soluble screening agents capable of absorbing UV rays from 280 to 320 nm (UVB)

Mention may be made, among the water-soluble screening agents capable of absorbing UVB rays according to the invention, of:

- benzimidazole derivatives comprising at least one sulfonic radical, such as 2-phenylbenzimidazole-5-sulfonic acid (INCI name: Phenylbenzimidazole Sulfonic Acid),

p-aminobenzoic acid (PABA) derivatives, such as:

PABA,

Glyceryl PABA and

PEG-25 PABA, sold under the name Uvinul P25 by BASF,

DEA Methoxycinnamate.

Preferably, the composition according to the invention comprises at least one water-soluble UV screening agent chosen from benzimidazole derivatives comprising at least one sulfonic radical.

Preferably, the benzimidazole derivative comprising at least one sulfonic radical according to the invention is 2-phenylbenzimidazole-5-sulfonic acid (INCI name: Phenylbenzimidazole Sulfonic Acid).

The benzimidazole derivative comprising at least one sulfonic radical according to the invention is, for example, 2-phenylbenzimidazole-5-sulfonic acid (INCI name: Phenylbenzimidazole Sulfonic Acid) available in particular under the trade name 103089 Neo Heliopan Hydro by Symrise, under the trade name Chemsol-HS by Chemspec Chemicals or under the trade name Eusolex 232 by Merck.

The total content of active material of the water-soluble UV screening agent(s) present in the composition according to the invention preferably ranges from 0.1% to 3% by weight, preferably from 0.2% to 1% by weight and more preferentially from 0.75% to 0.9% by weight, with respect to the total weight of the composition.

In a preferred embodiment, the composition according to the invention comprises ascorbic acid and at least one water-soluble UV screening agent at a ratio of the total content of the water-soluble UV screening agent(s) by weight of active material/total content by weight of ascorbic acid of from 0.006 to 0.2 and more preferentially from 0.013 to 0.06.

Cationic polymer chosen from cationic galactomannan gums and cationic cellulose polymers modified by groups comprising at least one linear fatty chain

In a preferred embodiment, the composition according to the invention can additionally comprise a cationic polymer chosen from cationic galactomannan gums (cationic guar) and cationic galactomannan gums and cationic cellulose polymers modified by groups comprising at least one linear fatty chain.

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The cationic polymer according to the invention is chosen from cationic galactomannan gums (cationic guar) and cationic cellulose polymers modified by groups comprising at least one linear fatty chain (preferably Polyquaternium-67).

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This is because, as shown in the examples, these polymers are more favorable to the cosmetic quality and to the stability of the compositions.

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The cationic polymer according to the invention can be a cationic galactomannan gum (cationic guar). The term "*cationic galactomannan gum*" is understood to mean any galactomannan gum containing cationic groups and/or groups which can be ionized to give cationic groups.

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Galactomannans are polysaccharides composed mainly of galactose and mannose units, in which the mannose units are bonded by a 1-4-glycoside bond and the galactose branching takes place by means of a 1-6 bridge to the mannose units. Each ring of the galactose or mannose units (or sugar units) carries three free hydroxyl groups available for the chemical reaction. Galactomannans are generally found in the endosperm of leguminous seeds, such as guar or locust bean.

The preferred cationic groups are chosen from those comprising primary, secondary, tertiary and/or quaternary amine groups.

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The cationic galactomannan gums used generally have a weight-average molecular weight of between 500 and 5×10^6 approximately and preferably of between 10^3 and 3×10^6 approximately.

30

The cationic galactomannan gums which can be used according to the present invention are, for example, gums comprising tri(C₁-C₄)alkylammonium cationic groups. Preferably, from 2% to 30% by number of the hydroxyl functional groups of these gums carry trialkylammonium cationic groups.

Mention may very particularly be made, among these trialkylammonium groups, of the trimethylammonium and triethylammonium groups.

More preferentially still, these groups represent from 5% to 20% by weight of the total weight of the modified galactomannan gum.

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According to the invention, the cationic galactomannan gum is preferably a guar gum comprising hydroxypropyl trialkylammonium groups, more preferentially a guar gum comprising hydroxypropyl trimethylammonium groups, that is to say a guar gum modified, for example, by 2,3-epoxypropyltrimethylammonium chloride.

5 These galactomannan gums, in particular guar gums modified by cationic groups, are products already known per se and are, for example, described in the patents US 3 589 578 and US 4 031 307. Such products are furthermore sold in particular under the trade names Jaguar Excel, Jaguar C13 S, Jaguar C 15, Jaguar C 17 and Jaguar C162 (Guar Hydroxypropyltrimonium Chloride) by Rhodia, under the name Amilan® Guar (Guar
10 Hydroxypropyltrimonium Chloride) by Degussa and under the name N-Hance® 3000 (Guar Hydroxypropyltrimonium Chloride) by Aqualon.

The cationic polymer according to the invention can alternatively be a cationic cellulose polymer modified by groups comprising at least one linear fatty chain. Within the meaning
15 of the present invention, a "cationic cellulose polymer" denotes any non-silicon (not comprising a silicon atom) cellulose polymer containing cationic groups and/or groups which can be ionized to give cationic groups, and preferably not containing anionic groups and/or groups which can be ionized to give anionic groups.

The term "*cellulose*" polymer is understood to mean, according to the invention, any
20 polysaccharide compound having, in its structure, at least 20 linkages of glucose residues united via β -1,4 bonds. The cellulose polymer can be associative, that is to say have, in its structure, at least one C₈-C₃₀ fatty chain.

The cationic cellulose polymers capable of being used preferably have a weight-average molar mass (Mw) of between 5000 and 5×10^6 approximately and preferably of between 10^3
25 and 3×10^6 approximately.

Mention may more particularly be made, among cationic celluloses, of cellulose ethers comprising quaternary ammonium groups modified by groups comprising at least one linear fatty chain.

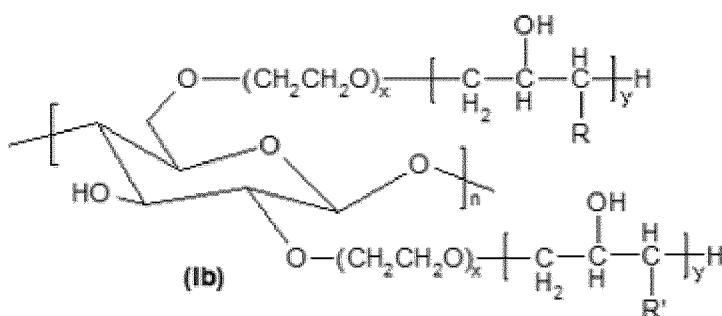
30 Mention may in particular be made, among quaternized celluloses, of quaternized celluloses modified by groups comprising at least one linear fatty chain, such as linear alkyl, linear or branched arylalkyl or linear alkylaryl, preferably linear alkyl, groups, these groups comprising at least 8 carbon atoms, in particular from 8 to 30 carbon atoms, better still from 10 to 24, indeed even from 10 to 14, carbon atoms; or mixtures of these.

35 Preferably, mention may be made of quaternized hydroxyethylcelluloses modified by groups comprising at least one linear fatty chain, such as linear alkyl, linear arylalkyl or linear

alkylaryl, preferably linear alkyl, groups, these groups comprising at least 8 carbon atoms, in particular from 8 to 30 carbon atoms, better still from 10 to 24, indeed even from 10 to 14, carbon atoms; or mixtures of these.

Preferentially, mention may be made of the hydroxyethylcelluloses of formula (Ib):

[Chem 2]



in which:

- R represents an ammonium group $-N^+R_aR_bR_c Q^-$ in which R_a , R_b and R_c , which are identical or different, represent a hydrogen atom or a linear C_1 - C_{30} alkyl, preferably an alkyl, and Q^- represents an anionic counterion, such as a halide, for example a chloride or bromide;

- R' represents an ammonium group $-N^+R'_aR'_bR'_c Q'^-$ in which R'_a , R'_b and R'_c , which are identical or different, represent a hydrogen atom or a linear C_1 - C_{30} alkyl and Q'^- represents an anionic counterion, such as a halide, for example a chloride or bromide; preferably an alkyl;

it being understood that at least one of the R_a , R_b , R_c , R'_a , R'_b and R'_c radicals represents a linear C_8 - C_{30} alkyl;

- n , x and y , which are identical or different, represent an integer of between 1 and 10 000.

Preferably, in the formula (Ib), at least one of the R_a , R_b , R_c , R'_a , R'_b and R'_c radicals represents a linear C_8 - C_{30} , better still C_{10} - C_{24} , indeed even C_{10} - C_{14} , alkyl; mention may in particular be made of the dodecyl (C_{12}) radical. Preferably, the other radical(s) represent(s) a linear C_1 - C_4 alkyl, in particular methyl.

Preferably, in the formula (Ib), just one of the R_a , R_b , R_c , R'_a , R'_b and R'_c radicals represents a linear C_8 - C_{30} , better still C_{10} - C_{24} , indeed even C_{10} - C_{14} , alkyl; mention may in particular be made of the dodecyl (C_{12}) radical. Preferably, all the other radicals represent a linear C_1 - C_4 alkyl, in particular methyl.

Even better still, R can be a group chosen from $-N^+(CH_3)_3 Q^-$ and $-N^+(C_{12}H_{25})(CH_3)_2 Q^-$, preferably an $-N^+(CH_3)_3 Q^-$ group.

Even better still, R' can be an $-N^+(C_{12}H_{25})(CH_3)_2 Q^-$ group.

The percentage of nitrogen can vary from 0.1% to 10% by weight, with respect to the total weight of polymer, preferably from 0.2% to 5% by weight and better still from 0.5% to 3% by weight.

Mention may in particular be made of the polymers having the INCI name:

- Polyquaternium-24, such as the product Quatrisoft LM 200®, sold by Amerchol/Dow Chemical;
- PG-Hydroxyethylcellulose Cocodimonium Chloride, such as the product Crodacel QM®;
- PG-Hydroxyethylcellulose Lauryldimonium Chloride (C_{12} alkyl), such as the product Crodacel QL®; and
- PG-Hydroxyethylcellulose Stearyldimonium Chloride (C_{18} alkyl), such as the product Crodacel QS®, which are sold by Croda.

Mention may also be made of the hydroxyethylcelluloses of formula (Ib) in which R represents a trimethylammonium halide and R' represents a dimethyldodecylammonium halide; preferentially, R represents trimethylammonium chloride $-N^+(CH_3)_3 Cl^-$ and R' represents dimethyldodecylammonium chloride $-N^+(CH_3)_2(C_{12}H_{25}) Cl^-$. This type of polymer is known under the INCI name: Polyquaternium-67; mention may be made, as commercial products, of the Softcat Polymer SL® polymers, such as SL-100, SL-60, SL-30, SL-5 and SX-1300X, from Amerchol/Dow Chemical.

More particularly, the cationic cellulose polymer is chosen from hydroxyethylcelluloses which have reacted with a trimethylammonium epoxide and a lauryldimethylammonium epoxide (INCI name: Polyquaternium-67).

It is preferably sold under the name Softcat Polymer SL-100 or Softcat Polymer SX-1300X by Amerchol.

According to a preferred embodiment, the cosmetic composition according to the invention comprises at least one cationic polymer chosen from guar gums comprising trialkylammonium cationic groups and quaternized hydroxyethylcelluloses modified by groups comprising at least one linear fatty chain; preferably from hydroxyethylcelluloses of formula (Ib) as defined above in which R represents the trimethylammonium halide and R' represents the dimethyldodecylammonium halide,

and preferably from guar hydroxypropyl trimethylammonium chloride and hydroxyethylcelluloses which have reacted with a trimethylammonium epoxide and a lauryldimethylammonium epoxide (INCI name: Polyquaternium-67).

5 The total content of active material of the cationic polymer(s) which can be present in the composition according to the invention preferably ranges from 0.05% to 5% by weight, preferably from 0.3% to 3% by weight and more preferentially from 0.4% to 2% by weight, with respect to the total weight of the composition.

10 Sugar alcohol

In a preferred embodiment, the composition according to the invention additionally comprises at least one sugar alcohol.

The term "sugar alcohol" denotes a sugar comprising only hydroxyl functional groups.

15 These sugar alcohols differ from ketoses and aldoses, which comprise ketone or aldehyde functional groups. Sugar alcohols are in particular described in the encyclopedia Kirk-Othmer Encyclopedia of Chemical Technology, John Wiley and Sons, article "Sugar Alcohols", 2005.

Preferably, the sugar alcohols which can be used in the compositions according to the invention correspond to the general formula:

[Chem 3]



with n an integer ranging from 2 to 5.

25 The sugar alcohol can be chosen from erythritol, sorbitol, threitol, ribitol, arabinitol, allitol, dulcitol, iditol, altritol, lactitol, maltitol, mannitol, xylitol and the mixtures of these compounds.

Preferably, the sugar alcohol can be chosen from maltitol, sorbitol and the mixture of these compounds.

Preferably, the composition according to the invention comprises maltitol, sorbitol or their mixture and preferentially comprises maltitol and sorbitol.

30 The total content of sugar alcohol(s), preferably of maltitol and sorbitol, which can be present in the composition according to the invention preferably ranges from 0.05% to 5% by weight of active material, preferably from 0.075% to 3% by weight of active material and more preferentially from 0.15% to 2.25% by weight of active material, with respect to the total weight of the composition.

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pH of the composition

The composition according to the invention exhibits a pH of from 5.0 to 7.0. Advantageously, the pH of the composition is between 5.5 and 6.5.

This is because such a pH limits the deterioration in the color of the ascorbic acid and thus limits the transformation of a colorless composition into a composition which becomes yellow to brown over time. When the pH is less than 5, the composition becomes brown and, graded on a color scale ranging from 0 (white, very light) to 9 (black, very dark), it exhibits a grade above 8.

Preferably, the cosmetic composition according to the invention comprises at least one base.

The base is used in particular to increase the final pH of the composition between 5.0 and 7.0, preferably between 5.5 and 6.5.

The base can be chosen from inorganic bases, such as, for example, alkali metal hydroxides, sodium hydroxide or potassium hydroxide.

Preferably, the base of the composition is an alkali metal hydroxide, preferably sodium hydroxide or potassium hydroxide. This is because these bases are more advantageous than nitrogenous bases, such as triethanolamine, with regard to the stabilization of the color (i.e. less yellowing).

Preferably, the base of the composition according to the invention is present in a base:ascorbic acid ratio by weight ranging from 0.22 to 0.30.

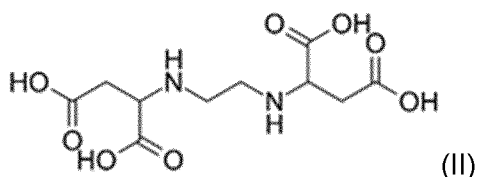
The composition can also comprise one or more additive(s) conventionally used in cosmetic compositions, such as, for example, active principles, sequestering agents, glycols, preservatives or also fragrances.

Preferably, among the active principles which can be used, preference is given to adenosine, salicylic acid, glycolic acid, niacinamide (vitamin B3), tocopherol or also fragrances.

The composition according to the invention can comprise at least one sequestering agent. Mention may be made, among the preferred sequestering agents, of the salts of ethylenediaminedisuccinic acid.

Ethylenediaminedisuccinic acid is a compound of formula (II):

[Chem 3]



Preferably, the salt of ethylenediaminedisuccinic acid is chosen from the alkali metal salts, such as potassium salts and sodium salts, ammonium salts and amine salts. The alkali metal salts of ethylenediaminedisuccinic acid are more particularly preferred.

Preferably, the salt of ethylenediaminedisuccinic acid used according to the invention is trisodium ethylenediaminedisuccinate.

Such a compound is, for example, that sold under the name Natrlquest® E30 by Innospec Active Chemicals, or also that sold under the name Octaquest E30® by Octel Performance Chemicals.

Preferably, the composition according to the invention comprises from 0.01% to 2.5% by weight, preferably from 0.05% to 1.5% by weight, more preferentially from 0.07% to 0.3% by weight, of salt of ethylenediaminedisuccinic acid, with respect to the total weight of the composition.

It is understood that the content of salt of ethylenediaminedisuccinic acid corresponds to the content of active material, also known as solids content, of salt of ethylenediaminedisuccinic acid introduced into the composition.

According to a specific alternative embodiment, the salt of ethylenediaminedisuccinic acid can be introduced into the composition dissolved in water, in particular at a content ranging from 25% to 50% by weight, preferably from 35% to 40% by weight, in the water.

Such a compound is, for example, that sold under the name Natrlquest® E30 by Innospec Active Chemicals, at 37% by weight in water.

The composition according to the invention can comprise at least one glycol, preferably caprylyl glycol.

Preferably, the composition according to the invention comprises from 0.1% to 2% by weight, preferably from 0.2% to 1.5% by weight, of glycol(s), with respect to the total weight of the composition.

The composition according to the invention can comprise at least one preservative.

Mention may be made, among the preferred preservatives, of hydroxyacetophenone, phenoxyethanol and their mixtures.

Preferably, the composition according to the invention comprises from 0.1% to 2% by weight, preferably from 0.5% to 1.5% by weight, more preferentially from 0.7% to 1% by weight, of preservative(s), with respect to the total weight of the composition.

Preferably, the composition of the present invention is transparent.

The term "transparent composition" is understood to mean, within the meaning of the present invention, a composition exhibiting a turbidity value of less than 200 NTU, preferably of less than 150 NTU, preferably of less than 100 NTU. Preferably, the turbidity of the compositions is at least equal to 1 NTU.

The NTU (nephelometric turbidity unit) is the unit of measurement of the turbidity of a composition. The measurement of the turbidity is carried out, for example, with a 2100P model turbidimeter from Hach, the tubes used for the measurement being referenced AR397A cat 24347-06. The measurements are carried out at ambient temperature (from 20°C to 25°C).

Preferably, the composition is transparent and exhibits a turbidity value of between 1 and 200 NTU, preferably between 1 and 150 NTU, preferably of less than 100 NTU.

Finally, the invention also relates to a cosmetic method for caring for keratin materials, preferably the skin, comprising the application, to said keratin materials, of a composition according to the invention.

Concrete but in no way limiting examples illustrating the invention will now be given.

EXAMPLES

In the examples, the pressure is atmospheric pressure, unless otherwise indicated. Unless otherwise mentioned, the percentages are expressed by weight, with respect to the total weight of composition (% w/w).

5 **Example 1: Influence of water-soluble UV screening agent on the stabilization of the color of an aqueous solution comprising 10% and 12% by weight of vitamin C**

[Table 1]

Ingredients (% w/w)	Formula A according to the invention	Formula B, comparativ e	Formula C according to the invention	Formula D, comparative	Phase
Sodium hydroxide (NaOH)	q.s. pH 6	q.s. pH 6	q.s. pH 6	q.s. pH 6	A
Ascorbic acid	10	10	12.00	12.00	A
Water	87.1	87.1	75.87	74.12	A
Glycerol			7.00	7.00	C
Caprylyl glycol	0.30	0.30	0.30	0.30	C
Hydroxyethylpiperazine Ethane Sulfonic Acid (HEPES-Luv from Taiwan Hopax)				2.50	C
Phenylbenzimidazole Sulfonic Acid (103089 Neo Heliopan Hydro from Symrise)	1		0.75		B
Terephthalylidene Dicamphor Sulfonic Acid (Mexoryl SX from Noveal, at 33% by weight of a.m. in water)		1			B
Polyquaternium-67 (Softcat Polymer SL-100 from Amerchol)			0.50	0.50	A
Trisodium ethylenediaminedisuccin ate (Natrlquest® E30 from Innospec Active Chemicals, at 37% by weight of a.m. in water)			0.20	0.20	C
Hydroxyacetophenone (Symsave H O from Symrise)			0.50	0.50	C
Phenoxyethanol	0.7	0.7			C
Carbomer (Carbopol 980 Polymer from Lubrizol)	0.7	0.7			A

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Xanthan Gum (v from CP Kelco)	0.2	0.2			A
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a.m. : active material

The preparation is carried out of gelled aqueous solutions comprising 10% or 12% by weight of ascorbic acid, having a pH equal to 6, the pH having been adjusted with sodium hydroxide (NaOH);

- comprising 2-phenylbenzimidazole-5-sulfonic acid (INCI name: Phenylbenzimidazole Sulfonic Acid) at 1% or 0.75% by weight (Formulae A and C according to the invention);
- comprising a water-soluble UVA screening agent, outside the definition of water-soluble UV screening agents according to the present invention, which is Terephthalylidene Dicamphor Sulfonic Acid available under the name Mexoryl SX from Chimex (comparative Formula B);
- comprising 4-(2-hydroxyethyl)-1-piperazineethanesulfonic acid (INCI name: Hydroxyethylpiperazine Ethane Sulfonic Acid or HEPES) (comparative Formula C).

A test of stability of the solutions is carried out for 15 days, 1 month and 2 months at 45°C.

The results show that the replacement of 2-phenylbenzimidazole-5-sulfonic acid (INCI name: Phenylbenzimidazole Sulfonic Acid) by Terephthalylidene Dicamphor Sulfonic Acid (Mexoryl SX), a water-soluble UV screening agent outside the definition of the choice of the UV screening agents according to the invention, runs counter to the anticipated effect because the formula obtained is cloudy due to the presence of crystals and does not make it possible to resolve the issue of the invention, which is to obtain a transparent serum.

Terephthalylidene Dicamphor Sulfonic Acid (Mexoryl SX), which comprises a sulfonate functional group, is not compatible in terms of chemical stability of the compositions according to the invention comprising 1% by weight of ascorbic acid and thus does not make possible the reduction in color.

The results furthermore show that the replacement of 2-phenylbenzimidazole-5-sulfonic acid (INCI name: Phenylbenzimidazole Sulfonic Acid) by 4-(2-hydroxyethyl)-1-piperazineethanesulfonic acid (HEPES), also containing a sulfonate functional group, runs counter to the anticipated effect, that is to say that there is a deterioration in the color, which is increasingly dark (> 4 on the color scale).

The condition of a pH of 6 is not sufficient to stabilize the color of an aqueous solution of vitamin C.

Not all water-soluble UV screening agents or compounds exhibiting a sulfonate functional group are effective in this functionality.

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Surprisingly, for the compositions according to the invention, Formulae 1 and C, the solutions obtained are all stable, in particular after storage at 45°C for 2 months, and show an acceptable loss of vitamin C.

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The combination of sodium hydroxide or potassium hydroxide with a water-soluble UV screening agent according to the invention, such as benzimidazole derivatives comprising at least one sulfonic radical, for example 2-phenylbenzimidazole-5-sulfonic acid (INCI name: Phenylbenzimidazole Sulfonic Acid), makes it possible to stabilize the color of solutions of vitamin C.

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Only the water-soluble UV screening agents according to the invention, such as benzimidazole derivatives comprising at least one sulfonic radical, make it possible simultaneously to combine the stabilization of the color and the achievement of a completely transparent serum.

Example 3: Compositions according to the invention

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The Formulae E to J according to the invention below are prepared according to the following protocol:

Phase A: in the main reactor:

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1. The water is inserted at ambient temperature.
2. The ascorbic acid is inserted and mechanical stirring is carried out.
3. NaOH is added and adjusting is carried out to bring the pH to 5.8.
4. The polyquaternium-67 is added and stirring is carried out for 10 min.

Phase B: in an auxiliary reactor:

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1. The water and the different compounds of phase B are inserted, then heating is carried out to 60°C and stirring is carried out for 10 min.
2. The temperature is brought back again to 25°C.

Phase C: in an auxiliary reactor:

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1. The water and the 2-phenylbenzimidazole-5-sulfonic acid are inserted and then stirring is carried out.

2. The sodium hydroxide is added and then there is a wait for the solution to become clear/colorless (with a pH of 6.22 ± 0.3).

Combining of the phases (in the main reactor):

The 3 phases are combined in the main vessel and the q.s. is made with water.

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[Table 2]

Ingredients (% w/w)	Formula E	Formula F	Formula G	Formula H	Formula I	Formula J	Phase
Sodium hydroxide (NaOH)	2.88	2.88	2.88	2.88	2.88	2.88	A
Ascorbic acid	12.00	12.00	12.00	12.00	12.00	12.00	A
Water	76.12	75.12	74.12	73.42	75.67	75.52	A
Phenylbenzimidazole Sulfonic Acid (103089 Neo Heliopan Hydro from Symrise)	0.50	0.75	0.25	0.20	0.20	0.90	B
Glycerol	7.00	7.00	7.00	7.00	7.00	7.00	C
Caprylyl glycol	0.30	0.30	0.30	0.30	0.30	0.30	C
Maltitol (and) Sorbitol (Amalty Syrup from Kankohsha, comprising 73% by weight of maltitol and 2% by weight of sorbitol in water)		0.75	2.25	3.00	0.75	0.20	C
Polyquaternium-67 (Softcat Polymer SL-100 from Amerchol)	0.50	0.50	0.50	0.50	0.50	0.50	A
Trisodium ethylenediaminedi succinate (NatrIquest® E30 from Innospec Active Chemicals, at 37% by weight of a.m. in water)	0.20	0.20	0.20	0.20	0.20	0.20	C
Hydroxyacetophenone (Symsave H O from Symrise)	0.50	0.50	0.50	0.50	0.50	0.50	C

a.m. : active material

The compositions E to J according to the invention comprising at least one water-soluble UV screening agent defined according to the invention, in particular benzimidazole derivatives comprising at least one sulfonic radical, such as 2-phenylbenzimidazole-5-sulfonic acid (INCI name: Phenylbenzimidazole Sulfonic Acid), and which can also comprise at least one cationic polymer, such as cationic cellulose polymers (Polyquaternium-67), and optionally in addition at least one sugar alcohol, such as maltitol and/or sorbitol, exhibit a stabilization of the color while being completely transparent.

The compositions according to the invention exhibit in particular the following properties:

- maintenance of the transparency at 1 (scale from 1 to 3: 1 being transparent, 2 translucent, 3 opaque) over time and at temperature (after 2 months at 4°C, ambient temperature and 45°C);

- no or slight emission of gas which is acceptable, that is to say release of CO₂ due to the decomposition of the ascorbic acid over time and at temperature (after 2 months at 4°C, ambient temperature and 45°C);

- no crystals observed macroscopically and microscopically over time and at temperature (after 2 months at 4°C, ambient temperature and 45°C); and

- physicochemical stability over time and at temperature (after 2 months at 4°C, ambient temperature and 45°C).

CLAIMS

1. A cosmetic composition comprising:

- at least 30% by weight of water, with respect to the total weight of the composition,
 - at least 5% by weight of ascorbic acid, with respect to the total weight of the composition,
 - at least one water-soluble UV screening agent chosen from bis-benzazoyl derivatives, benzimidazole derivatives comprising at least one sulfonic radical, p-aminobenzoic acid derivatives and their mixtures,
- said composition having a pH of between 5 and 7.

2. The composition as claimed in claim 1, characterized in that it additionally comprises at least one cationic polymer chosen from cationic galactomannan gums and cationic cellulose polymers modified by groups comprising at least one linear fatty chain.

3. The composition as claimed in claim 1 or claim 2, characterized in that it comprises from 30% to 93% by weight of water, with respect to the total weight of the composition, more preferentially from 50% to 90%, more preferentially still from 55% to 70%.

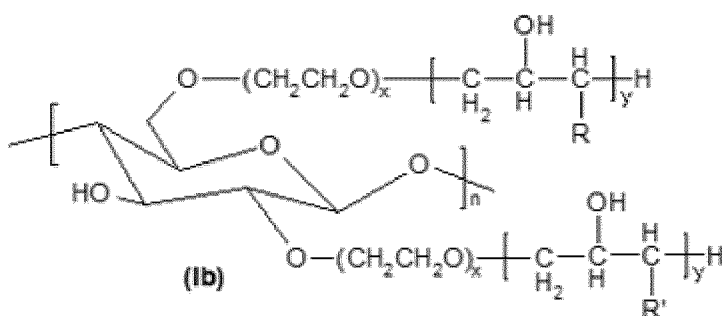
4. The composition as claimed in one of claims 1 to 3, characterized in that it comprises at least one organic solvent which is soluble in water, at 25°C, chosen from alcohols, polyols and their mixtures; preferably chosen from C₁-C₁₀ alcohols, more preferentially C₁-C₅ alcohols, such as ethanol, isopropanol, propanol and butanol, and polyols having from 2 to 20 carbon atoms, more preferentially from 2 to 6 carbon atoms, such as glycerol, diglycerol, propylene glycol, isoprene glycol, dipropylene glycol, butylene glycol, hexylene glycol, 1,3-propanediol, pentylene glycol, polyethylene glycols having from 2 to 200 ethylene oxide units and their mixtures.

5. The composition as claimed in one of claims 1 to 4, characterized in that it comprises at least 7% by weight of ascorbic acid, with respect to the total weight of the composition; preferably, the composition comprises from 5% to 30% by weight of ascorbic acid, with respect to the total weight of the composition, more preferentially from 7% to 20% by weight.

6. The composition as claimed in one of claims 2 to 5, characterized in that the cationic polymer is chosen from guar gums comprising trialkylammonium cationic

groups and quaternized hydroxyethylcelluloses modified by groups comprising at least one linear fatty chain; preferably from hydroxyethylcelluloses of formula (Ib) in which R represents the trimethylammonium halide and R' represents the dimethyldodecylammonium halide

[Chem 2]



and preferably from guar hydroxypropyl trimethylammonium chloride and hydroxyethylcelluloses which have reacted with a trimethylammonium epoxide and a lauryldimethylammonium epoxide (INCI name: Polyquaternium-67).

7. The composition as claimed in one of claims 2 to 6, characterized in that it comprises from 0.05% to 5% by weight of active material of cationic polymer, with respect to the total weight of the composition, more preferentially from 0.3% to 3% by weight, more preferentially still from 0.4% to 2% by weight.

8. The composition as claimed in one of claims 1 to 7, characterized in that the water-soluble UV screening agent(s) is(are) chosen from benzimidazole derivatives comprising at least one sulfonic radical.

9. The composition as claimed in claim 8, characterized in that the benzimidazole derivative comprising at least one sulfonic radical is 2-phenylbenzimidazole-5-sulfonic acid (INCI name: Phenylbenzimidazole Sulfonic Acid).

10. The composition as claimed in one of claims 1 to 9, characterized in that it comprises from 0.1% to 3% by weight of active material of water-soluble UV screening agent, with respect to the total weight of the composition, more preferentially 0.2% to 1% from by weight, more preferentially still from 0.75% to 0.9% by weight.

11. The composition as claimed in one of claims 1 to 10, characterized in that it additionally comprises at least one sugar alcohol, preferably maltitol and/or sorbitol, in particular comprises maltitol and sorbitol.

5 12. The composition as claimed in one of claims 1 to 11, characterized in that it comprises from 0.05% to 5% by weight of active material of sugar alcohol, with respect to the total weight of the composition, more preferentially from 0.075% to 3% by weight, more preferentially still from 0.15% to 2.25% by weight.

10 13. The composition as claimed in one of claims 1 to 12, characterized in that the pH of the composition is between 5.5 and 6.5.

14. The composition as claimed in one of claims 1 to 13, characterized in that it comprises at least one base; preferably, the base of the composition is an alkali metal hydroxide, preferably sodium hydroxide or potassium hydroxide, and more preferentially sodium hydroxide.

15 15. The composition as claimed in one of claims 1 to 14, characterized in that it comprises at least one additive chosen from active principles, sequestering agents, glycols, preservatives and fragrances; preferably, it comprises at least one sequestering agent chosen from salts of ethylenediaminedisuccinic acid, and/or at least one glycol which is preferably caprylyl glycol, and/or at least one preservative, preferably chosen from hydroxyacetophenone, phenoxyethanol and their mixtures.

20 16. The composition as claimed in one of claims 1 to 15, characterized in that it is transparent.

25 17. A cosmetic method for caring for keratin materials, preferably the skin, comprising the application, to said keratin materials, of a composition as claimed in one of claims 1 to 16.

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INTERNATIONAL SEARCH REPORT

International application No

PCT/EP2022/067783

C(Continuation). DOCUMENTS CONSIDERED TO BE RELEVANT		
Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
Y	US 2002/055532 A1 (HEYWANG ULRICH [US] ET AL) 9 May 2002 (2002-05-09) paragraphs [0079], [0080]; claim 10 -----	1-17
Y	US 2002/136771 A1 (PARR JAMES [US] ET AL) 26 September 2002 (2002-09-26) paragraphs [0014], [0029] - [0030] example 2 claims 1, 3, 6, 25 -----	1-17
Y	KR 102 184 317 B1 (YOON MOUNG SEOK [KR]) 30 November 2020 (2020-11-30) paragraphs [0011], [0016], [0064]; claim 1 -----	1-17
Y	KR 2016 0112721 A (KIM JU HO [KR]; OH HOON [KR]) 28 September 2016 (2016-09-28) Abstract paragraph [0027]; claim 3 examples -----	1-17

INTERNATIONAL SEARCH REPORT

Information on patent family members

International application No

PCT/EP2022/067783

Patent document cited in search report	Publication date	Patent family member(s)	Publication date
US 5455035	A	03-10-1995	NONE
US 2008233076	A1	25-09-2008	NONE
US 2004081629	A1	29-04-2004	US 2004081629 A1 29-04-2004
			US 2007189993 A1 16-08-2007
US 2002055532	A1	09-05-2002	AT 276237 T 15-10-2004
			DE 10030663 A1 10-01-2002
			EP 1167358 A1 02-01-2002
			ES 2227022 T3 01-04-2005
			JP 2002047275 A 12-02-2002
			US 2002016349 A1 07-02-2002
			US 2002055532 A1 09-05-2002
US 2002136771	A1	26-09-2002	NONE
KR 102184317	B1	30-11-2020	NONE
KR 20160112721	A	28-09-2016	NONE