

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

(19) World Intellectual Property

Organization

International Bureau

(43) International Publication Date

18 June 2020 (18.06.2020)



(10) International Publication Number

WO 2020/122086 A1

(51) International Patent Classification:

A61K 8/03 (2006.01) A61Q 17/04 (2006.01)

A61K 8/37 (2006.01) A61K 8/49 (2006.01)

A61K 8/40 (2006.01)

(21) International Application Number:

PCT/JP2019/048365

(22) International Filing Date:

04 December 2019 (04.12.2019)

(25) Filing Language:

English

(26) Publication Language:

English

(30) Priority Data:

2018-231471 11 December 2018 (11.12.2018) JP

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(81) Designated States (unless otherwise indicated, for every

kind of national protection available): AE, AG, AL, AM, AO, AT, AU, AZ, BA, BB, BG, BH, BN, BR, BW, BY, BZ, CA, CH, CL, CN, CO, CR, CU, CZ, DE, DJ, DK, DM, DO, DZ, EC, EE, EG, ES, FI, GB, GD, GE, GH, GM, GT, HN, HR, HU, ID, IL, IN, IR, IS, JO, KE, KG, KH, KN, KP, KR, KW, KZ, LA, LC, LK, LR, LS, LU, LY, MA, MD, ME, MG, MK, MN, MW, MX, MY, MZ, NA, NG, NI, NO, NZ, OM, PA, PE, PG, PH, PL, PT, QA, RO, RS, RU, RW, SA, SC, SD, SE, SG, SK, SL, SM, ST, SV, SY, TH, TJ, TM, TN, TR, TT, TZ, UA, UG, US, UZ, VC, VN, ZA, ZM, ZW.

(84) Designated States (unless otherwise indicated, for every

kind of regional protection available): ARIPO (BW, GH, GM, KE, LR, LS, MW, MZ, NA, RW, SD, SL, ST, SZ, TZ, UG, ZM, ZW), Eurasian (AM, AZ, BY, KG, KZ, RU, TJ, TM), European (AL, AT, BE, BG, CH, CY, CZ, DE, DK, EE, ES, FI, FR, GB, GR, HR, HU, IE, IS, IT, LT, LU, LV, MC, MK, MT, NL, NO, PL, PT, RO, RS, SE, SI, SK, SM, TR), OAPI (BF, BJ, CF, CG, CI, CM, GA, GN, GQ, GW, KM, ML, MR, NE, SN, TD, TG).

Published:

— with international search report (Art. 21(3))

(54) Title: BI-PHASE SUN CARE COMPOSITION

(57) Abstract: The present invention relates to a bi-phase composition comprising an aqueous phase and an oily phase, wherein the composition comprises: (a) at least one solid organic UV-B filter, (b) at least one liquid organic UV-B filter, (c) at least one powder, and (d) water. The composition can be useful as a sun care composition.

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DESCRIPTION

BI-PHASE SUN CARE COMPOSITION

TECHNICAL FIELD

The present invention relates to a sun care composition, in particular a sun care cosmetic composition in a bi-phase form, for a keratinous substance such as skin.

BACKGROUND ART

For sun care products, good UV protecting effects and good usability are among the key functions. In addition, in order to satisfy consumers' preferences, it is preferable that sun care products show a clear appearance.

Bi-phase compositions comprising an aqueous phase and an oily phase have a benefit regarding their usability thanks to their low viscosity. In addition, they have another benefit regarding their appearance since they do not show a whitish appearance as emulsion compositions do.

To date, some prior art documents exist relating to sun care compositions having the bi-phase form. For example, JP-A-2015-199689 discloses a composition separated into two phases and containing (A) an oil soluble ultraviolet absorber, (B) a water soluble polymer thickener; and (C) a nonionic surfactant, which can be easily mixed homogenously at the time of use and can be sprayed in a misty state. In addition, JP-A-2002-193742 discloses a double layered liquid cosmetic wherein powder is floating in an interface between an upper phase and lower phase.

However, there is still a need for sun care compositions in the bi-phase form having a better UV protection property and mist-forming quality.

DISCLOSURE OF INVENTION

An objective of the present invention is to provide a bi-phase sun-care composition having a good UV protecting property and mist-forming quality.

The above objective can be achieved by a bi-phase composition comprising an aqueous phase and an oily phase, wherein the composition comprises:

- (a) at least one solid organic UV-B filter,
- (b) at least one liquid organic UV-B filter,
- (c) at least one powder, and
- (d) water.

The (a) solid organic UV-B filter may comprise triazine compounds selected from ethylhexyl triazone, diethylhexyl butamido triazone, 2,4,6-tris(dineopentyl 4'-aminobenzalmalonate)-s-triazine, 2,4,6-tris(diisobutyl 4'-aminobenzalmalonate)-s-triazine, 2,4-bis(dineopentyl 4'-aminobenzalmalonate)-6-(n-butyl 4'-aminobenzoate)-s-triazine,

2,4-bis(n-butyl 4'-aminobenzoate)-6-(aminopropyltrisiloxane)-s-triazine, bis-ethylhexyloxyphenol methoxyphenyl triazine, and mixtures thereof.

The (b) liquid organic UV-B filter may be selected from salicylic compounds, β,β -diphenylacrylate compounds, and mixtures thereof.

The composition may comprise the (a) solid organic UV-B filter selected from triazine compounds and the (b) liquid organic UV-B filter selected from salicylic compounds, β,β -diphenylacrylate compounds, and mixtures thereof.

The (c) powder may comprise inorganic powders selected from mica, silica, magnesium aluminium silicate, trimethyl siloxysilicate or silica silylate, kaolin, bentone, calcium carbonate, magnesium hydrogen carbonate, hydroxyapatite, boron nitride, fluorphlogopite, sericite, calcinated talc, calcinated mica, calcinated sericite, synthetic mica, perlite, lauroyl lysine, metal soap, bismuth oxychloride, barium sulfate, magnesium carbonate, and mixtures thereof.

The (c) powder may comprise organic powders selected from acrylic polymer powders, silicone powders, wax powders, polyamide powders, urethane polymer powders, tetrafluoroethylene polymer powders, polyacrylonitrile powders, poly- β -alanine powders, polyethylene powders, polytetrafluoroethylene powders, lauroyllysine, starch, cellulose powder, tetrafluoroethylene polymer powders, and mixtures thereof.

The amount of the (a) solid organic UV filter(s) may range from 0.01 to 15% by weight, preferably from 0.05 to 10% by weight, and more preferably from 0.1 to 5% by weight, relative to the total weight of the composition.

The amount of the (b) liquid organic UV filter(s) may range from 0.1 to 30% by weight, preferably from 1 to 20% by weight, and more preferably from 3 to 15% by weight, relative to the total weight of the composition.

The amount of the (c) powder (s) may range from 0.001 to 10% by weight, preferably from 0.01 to 5% by weight, more preferably from 0.1 to 3% by weight, and even more preferably from 0.2 to 2% by weight, relative to the total weight of the composition.

The composition according to the present invention may comprise at least one organic UV-A filter.

The composition according to the present invention may comprise cationic, anionic, non-ionic, amphoteric or zwitterionic surfactants or emulsifiers in an amount of 3% by weight or less, preferably 2% by weight or less, and more preferably 1% by weight or less, relative to the total amount of the composition, or may be free of any kind of surfactant or emulsifier.

The composition according to the present invention may comprise inorganic UV filters in an amount of 3% by weight or less, preferably 2% by weight or less, and more preferably 1% by weight or less, relative to the total amount of the composition, or may be free of any kind of inorganic UV filter.

The composition may be a bi-phase composition having two layers of an aqueous phase and an oily phase at rest.

The present invention also relates to a cosmetic process for protecting keratinous substances, preferably skin, from UV radiation, comprising a step of applying the composition according to the present invention to the keratinous substances.

The present invention also relates to a product comprising a container and a spray nozzle, wherein the container comprises the composition according to the present invention.

BEST MODE FOR CARRYING OUT THE INVENTION

After diligent research, the inventors have discovered that a bi-phase composition of an aqueous phase and an oily phase, comprising at least one solid organic UV-B filter, at least one liquid organic UV-B filter, and at least one powder can provide a good UV protecting property and mist-forming quality.

Thus, the composition according to the present invention is a bi-phase composition comprising an aqueous phase and an oily phase, wherein the composition comprises:

- (a) at least one solid organic UV-B filter,
- (b) at least one liquid organic UV-B filter,
- (c) at least one powder, and
- (d) water.

Hereinafter, the composition according to the present invention will be explained in a more detailed manner.

[Composition]

The composition according to the present invention may be intended for use as a cosmetic topical composition. Thus, the composition according to the present invention may be intended for application onto a keratinous substance. Keratinous substance here means a material containing keratin as a main constituent element, and examples thereof include the skin, scalp, nails, lips, hair, and the like. In particular, the composition according to the present invention may be a skin sun care cosmetic composition for protecting skin from UV rays.

The composition according to the present invention has a bi-phase form comprising an aqueous phase and an oily phase, or an oily phase and a water in oil emulsion phase, preferably water in oil pickering emulsion phase.

The bi-phase composition according to the present invention means a composition comprising or consisting of two phases of an aqueous phase and an oily phase or the oily phase and the emulsion phase, which are visually and/or macroscopically separated at rest.

The term "aqueous phase" here means a phase that is liquid at room temperature, comprising or consisting of hydrophilic, water-soluble, or water-dispersible substances.

The term "oily phase" here means a phase that is liquid at room temperature, comprising or consisting of lipophilic, oil-soluble, or oil-dispersible substances.

The term “water in oil emulsion phase” here means a phase that is liquid at room temperature, comprising dispersed aqueous phases in an oily phase.

The bi-phase composition according to the present invention has two distinct layers visually at rest, each layer consisting of the continuous aqueous phase and the continuous oily phase, or the continuous oily phase and the water in oil emulsion phase, respectively.

The oily phase of the present invention preferably has a viscosity of less than 1000 mPa·s, preferably less than 300 mPa·s, more preferably less than 100 mPa·s at room temperature (25°C). The lower limit of the viscosity of the oily phase is not limited, but in general, the oily phase has a viscosity of more than 5mPa·s at room temperature.

The viscosity of the aqueous phase of the present invention is not particularly limited. Preferably, the viscosity of the aqueous phase can range from 15 to 40 mPa·s, more preferably from 17 to 30 mPa·s at room temperature.

For the viscosity measurement, VISCOMAN™ (GILSON Technology) can be used. The bulk viscosity (mPaS, PaS) is automatically calculated from the needed aspiration force in the small pipet (10 µL).

The composition according to the present invention is intended for use after mixing each phase homogenously, for example, by simply shaking it. Since the homogenous composition of the present invention after mixing has a relatively lower viscosity, especially a lower viscosity than an emulsion composition, the present invention has a benefit in that it can be easily sprayed in a misty state without using an aerosol device and easily spread on keratinous substances. Therefore, the composition according to the present invention may be contained in a non-aerosol device, such as a container equipped with a mist generating means, such as a mist-pump, a spray bottle, or a pump bottle.

The pH of the aqueous phase of the present invention is not particularly limited. The pH of the aqueous phase may range from 3.0 to 9.0, preferably from 4.0 to 8.0. The pH of the aqueous phase of the present invention can be adjusted to the desired value using acidifying or basifying agents commonly used in the cosmetics field.

The inventors of the present invention surprisingly found that the mixed composition according to the present invention, in particular applied as a mist, can form a homogenous and fine film on keratinous substances, such as skin. Accordingly, the composition can provide improved UV protecting effects. In addition, since the composition according to the present invention can be provided in a misty state, it allows consumers an easy retouch use, if necessary, even after sun-care products are once applied. Also, mist-state product of the present invention can be easily applied on make-up. Furthermore, the mist-state products of the present invention can provide a comfortable texture to consumers, which is totally different from aerosol spray-type products.

In addition, the composition according to the present invention has good stability in terms of a crystalline form. The composition according to the present invention can control the formation of a crystal in the composition even after storage.

The amount of the aqueous phase in the composition according to the present invention may

range from 20 to 80% by weight, preferably from 30 to 70% by weight, and more preferably from 40 to 60% by weight, relative to the total weight of the composition.

The amount of the oily phase in the composition according to the present invention may range from 20 to 80% by weight, preferably from 30 to 70% by weight, and more preferably from 40 to 60% by weight, relative to the total weight of the composition.

The composition according to the present invention comprises (a) at least one solid organic UV filter, (b) at least one liquid organic UV filter, (c) at least one powder, and (d) water. These ingredients will be explained in a more detailed manner below.

(Solid Organic UV-B Filter)

The composition according to the present invention comprises (a) at least one solid organic UV filter. Two or more solid organic UV filters may be used in combination. Thus, a single type of solid organic UV filter or a combination of different types of solid organic UV filters may be used.

The term "UV" here means ultraviolet radiation and comprises the UV-B region (260-320 nm in wavelength) and the UV-A region (320-400 nm in wavelength). Therefore, a UV-B filter means any material which has filtering effects on ultraviolet radiation in wavelengths of the UV-B region.

The term "solid" means that a substance is solid at 25°C under 1 atm.

The (a) solid organic UV-B filter may be hydrophilic and/or lipophilic, and preferably lipophilic.

The term "hydrophilic" here means that a substance is soluble in water at a concentration of at least 1% by weight relative to the total weight of the water at room temperature (25°C) and atmospheric pressure (10^5 Pa).

The term "lipophilic" here means that a substance is soluble in oils at a concentration of at least 1% by weight relative to the total weight of the oils at room temperature (25°C) and atmospheric pressure (10^5 Pa).

The solid organic UV-B filters used in the present invention may include, but are not limited to, triazine compounds, para-aminobenzoic acid compounds, benzylidenecamphor compounds, phenylbenzimidazole compounds, imidazoline compounds, and dibenzoylmethane compounds, and merocyanine compounds.

As the triazine compounds, mention may be made of ethylhexyl triazone, marketed under the name "UVINUL T-150" by BASF, diethylhexyl butamido triazone, marketed under the name "UVASORB HEB" by SIGMA 2V, 2,4,6-tris(dineopentyl 4'-aminobenzalmalonate)-s-triazine, 2,4,6-tris(diisobutyl 4'-aminobenzalmalonate)-s-triazine, 2,4-bis(dineopentyl 4'-aminobenzalmalonate)-6-(n-butyl 4'-aminobenzoate)-s-triazine, 2,4-bis(n-butyl 4'-aminobenzoate)-6-(aminopropyltrisiloxane)-s-triazine, and bis-ethylhexyloxyphenol methoxyphenyl triazine marketed under the trademark «TINOSORB S» by Ciba Geigy.

As the para-aminobenzoic acid derivatives, mention may be made of para-aminobenzoates (PABA), for example, ethyl PABA (para-aminobenzoate), ethyl dihydroxypropyl PABA, and ethylhexyl dimethyl PABA, marketed under the name "ESCALOL 5972 from ISP, Glyceryl PABA and PEG-25 PABA, and salts thereof such as sold under the name "Uvinul P25" by BASF.

As the benzylidenecamphor compounds, mention may be made of 3-benzylidene camphor, marketed under the name "MEXORYL SD" from CHIMEX, methylbenzylidene camphor, marketed under the name "EUSOLEX 6300" by MERCK, polyacrylamidomethyl benzylidene camphor, marketed under the name "MEXORYL SW" by CHIMEX, and terephthalylidene dicamphor sulfonic acid, marketed under the name "Mexoryl SX" by Chimex.

As the phenylbenzimidazole compounds, mention may be made of phenylbenzimidazole sulfonic acid, marketed under the name "Eusolex 232" by Merck, and disodium phenyl dibenzimidazole tetrasulfonate, marketed under the name "Neo Heliopan AP" by Haarmann and Reimer.

As the imidazoline compounds, mention may be made of ethylhexyl dimethoxybenzylidene dioxoimidazoline propionate.

As the dibenzoylmethane compounds, mention may be made of butyl methoxydibenzoylmethane, marketed in particular under the trademark "Parsol 1789" by Hoffmann-La Roche; and isopropyl dibenzoylmethane.

It is preferable that the (a) solid organic UV-B filter(s) be selected from the triazine compounds, such as ethylhexyl triazone, diethylhexyl butamido triazone, 2,4,6-tris(dineopentyl 4'-aminobenzalmalonate)-s-triazine, 2,4,6-tris(diisobutyl 4'-aminobenzalmalonate)-s-triazine, 2,4-bis(dineopentyl 4'-aminobenzalmalonate)-6-(n-butyl 4'-aminobenzoate)-s-triazine, 2,4-bis(n-butyl 4'-aminobenzoate)-6-(aminopropyltrisiloxane)-s-triazine, and bis-ethylhexyloxyphenol methoxyphenyl triazine.

The salts of the compounds that may be used are chosen in particular from salts of alkali metals, for example sodium or potassium; salts of alkaline-earth metals, for example calcium, magnesium or strontium; metal salts, for example zinc, aluminum, manganese or copper; salts of ammonium of formula NH_4^{+} ; quaternary ammonium salts; salts of organic amines, for instance salts of methylamine, dimethylamine, trimethylamine, triethylamine, ethylamine, 2-hydroxyethylamine, bis(2-hydroxyethyl)amine or tris(2-hydroxyethyl)amine; lysine or arginine salts.

The amount of the (a) solid organic UV filter(s) in the composition according to the present invention may be 0.01% by weight or more, preferably 0.05% by weight or more, and more preferably 0.1% by weight or more, relative to the total weight of the composition.

The amount of the (a) solid organic UV filter(s) in the composition according to the present invention may be 15% by weight or less, preferably 10% by weight or less, and more preferably 5% by weight or less, relative to the total weight of the composition.

Specifically, the amount of the (a) solid organic UV filter(s) in the composition according to

the present invention may range from 0.01 to 15% by weight, preferably from 0.05 to 10% by weight, and more preferably from 0.1 to 5% by weight, relative to the total weight of the composition.

5 (Liquid Organic UV-B Filter)

The composition according to the present invention comprises (b) at least one liquid organic UV-B filter. Two or more liquid organic UV-B filters may be used in combination. Thus, a single type of liquid organic UV-B filter or a combination of different types of liquid organic UV-B filters may be used.

The term "liquid" means that a substance is liquid at 25°C under 1 atm.

The (b) liquid organic UV-B filter may be hydrophilic and/or lipophilic, and preferably lipophilic.

The liquid organic UV-B filters used in the present invention may include, but are not limited to, salicylic compounds, cinnamate compounds, β,β -diphenylacrylate compounds, phenylbenzimidazole compounds, benzalmalonate compounds, and merocyanine compounds.

As the salicylic compounds, mention may be made of homosalate, marketed under the name "Eusolex HMS" by Rona/EM Industries, and ethylhexyl salicylate, marketed under the name "NEO HELIOPAN OS" by Symrise.

As the cinnamate compounds, mention may be made of ethylhexyl methoxycinnamate, marketed under the name "PARSOL CX" by DSM NUTRITIONAL PRODUCTS, isopropyl ethoxy cinnamate, isoamyl methoxy cinnamate, marketed under the name "NEO HELIOPAN E 1000" by Symrise, diisopropyl methylcinnamate, cinoxate, and glyceryl ethylhexanoate dimethoxycinnamate, and DEA methoxycinnamate and salts thereof.

As the β,β -diphenylacrylate compounds, mention may be made of octocrylene, marketed under the name "UVINUL N539" by BASF, and etocrylene, marketed under the name "UVINUL N35" by BASF.

As the benzalmalonate compounds, mention may be made of polyorganosiloxanes containing a benzalmalonate moiety, for example, Polysilicone-15, marketed under the name "Parsol SLX" by DSM NUTRITIONAL PRODUCTS, and di-neopentyl 4'-methoxybenzalmalonate.

It is preferable that the (b) liquid organic UV-B filter(s) be selected from salicylic compounds, such as homosalate and ethylhexyl salicylate, and β,β -diphenylacrylate compounds, such as octocrylene and etocrylene, and preferably from salicylic compounds.

In one preferred embodiment of the present invention, a combination of different types of the liquid organic UV-B filter(s) is used. In particular, a combination of at least one salicylic compound, such as homosalate and ethylhexyl salicylate, and at least one β,β -diphenylacrylate compound, such as octocrylene and etocrylene, can be used as the (b) liquid organic UV-B filters.

In another preferred embodiment of the present invention, the (b) liquid organic UV-B filters comprise different types of salicylic compounds, such as a combination of homosalate and

ethylhexyl salicylate.

The salts of the compounds that may be used are chosen in particular from salts of alkali metals, for example sodium or potassium; salts of alkaline-earth metals, for example calcium, magnesium or strontium; metal salts, for example zinc, aluminum, manganese or copper; salts of ammonium of formula NH_4^+ ; quaternary ammonium salts; salts of organic amines, for instance salts of methylamine, dimethylamine, trimethylamine, triethylamine, ethylamine, 2-hydroxyethylamine, bis(2-hydroxyethyl)amine or tris(2-hydroxyethyl)amine; lysine or arginine salts.

Regarding combinations of the (a) solid organic UV filter(s) and the (b) liquid organic UV filter(s), the composition according to the present invention preferably comprises the (a) solid organic UV-B filter selected from triazine compounds and the (b) liquid organic UV-B filter selected from salicylic compounds, β,β -diphenylacrylate compounds, and mixtures thereof. More preferably, the composition comprises at least one triazine compound as the (a) solid organic UV-B filter, at least one salicylic compound as the (b) liquid organic UV-B filter, and at least one β,β -diphenylacrylate compound as the (b) liquid organic UV-B filter. In this case, it is in particular preferred that different types of salicylic compound, such as a combination of homosalate and ethylhexyl salicylate, be included.

The amount of the (b) liquid organic UV filter(s) in the composition according to the present invention may be 0.1% by weight or more, preferably 1% by weight or more, and more preferably 3% by weight or more, relative to the total weight of the composition.

The amount of the (b) liquid organic UV filter(s) in the composition according to the present invention may be 30% by weight or less, preferably 20% by weight or less, and more preferably 15% by weight or less, relative to the total weight of the composition.

Specifically, the amount of the (b) liquid organic UV filter(s) in the composition according to the present invention may range from 0.1 to 30% by weight, preferably from 1 to 20% by weight, and more preferably from 3 to 15% by weight, relative to the total weight of the composition.

(Powder)

The composition according to the present invention comprises (c) at least one powder. Two or more types of powder may be used in combination. Thus, a single type of powder or a combination of different types of powder may be used.

The term “powder” should be understood as meaning colorless or white, mineral or synthetic particles of any shape, which are insoluble in the medium of the composition, irrespective of the temperature at which the composition is manufactured.

The (c) powder may be of any shape, platelet-shaped, spherical or oblong, irrespective of the crystallographic form (for example lamellar, cubic, hexagonal, orthorhombic, etc.).

The (c) powder can be inorganic or organic powder, which may or may not be surface-coated.

The average particle size of the (c) powder is not limited, but in general 50 μm or less, preferably 20 μm or less, and more preferably 10 μm or less. The average particle size of the

(c) powder is 0.2 μm or more, preferably 0.5 μm or more, and more preferably 1 μm or more. The term “average particle size” used herein represents a number-average size mean diameter which is given by the statistical particle size distribution to half of the population, referred to as D50. For example, the number-average size mean diameter can be measured by a laser diffraction particle size distribution analyzer, such as Mastersizer 2000 by Malvern Corp.

It would be important to mention that the (c) powder of the present invention is different from so-called “inorganic UV filter”. The (c) powder does not have an active, substantive UV filtering effect, while it can contribute to form a homogeneous and fine film on keratinous substances, such as skin, by the composition according to the present invention. Therefore, the (c) powder of the present invention is not an inorganic UV filter.

As the inorganic powder, mention may be made of talc, mica, silica, magnesium aluminium silicate, trimethyl siloxysilicate or silica silylate, kaolin, bentone, calcium carbonate, magnesium hydrogen carbonate, hydroxyapatite, boron nitride, fluorphlogopite, sericite, calcinated talc, calcinated mica, calcinated sericite, synthetic mica, perlite, lauroyl lysine, metal soap, bismuth oxychloride, barium sulfate, magnesium carbonate, and mixtures thereof, optionally hydrophilic- or hydrophobic-treated.

As the organic powder, mention may be made of acrylic polymer powders, silicone powders, wax powders, polyamide powders, urethane polymer powders, tetrafluoroethylene polymer powders, polyacrylonitrile powders, poly- β -alanine powders, polyethylene powders, polytetrafluoroethylene powders, lauroyllysine, starch, cellulose powder, tetrafluoroethylene polymer powders and mixtures thereof.

As the acrylic polymer powders, mention may be made of polymethyl methacrylate powders, polymethyl methacrylate/ethylene glycol dimethacrylate powders, polyallyl methacrylate/ethylene glycol dimethacrylate powders, lauryl methacrylate/ethylene glycol dimethacrylate powders, acrylate/ethylhexyl acrylate powders, and expanded hollow particles of acrylonitrile (co-) polymer, such as acrylonitrile/methacrylate/vinylidene chloride copolymer.

As examples of the acrylic polymer powder, mention may be made of:

- powder of crosslinked polymethyl methacrylate, for instance “Covabead LH85” sold by the company LC Wackherr, or of noncrosslinked polymethyl methacrylate, such as SJ Touch 1 sold by the company Nihon Junyaku;
- powder of methyl methacrylate/butyl acrylate copolymer sold under the name Sepipress M by the company Seppic;
- powder of methyl acrylate/ethylene copolymer sold under the name EMAA by the company Kobo Products Inc.;
- powder of methyl methacrylate/ethylene glycol dimethacrylate crosslinked copolymer sold under the name Ganzpearl GMP 0820 by the company Ganz Chemical, under the name Techpolymer MBP-8 by the company Sekisui Plastics, or else under the name SUNPMMA-S by the company Sunjin Chemical;
- powder of polymethyl methacrylate/ethylene glycol dimethacrylate, for example “Dow Corning 5640 Microsponge Skin Oil Adsorber” sold by the company Dow Corning;
- powder of methyl methacrylate/ethylene glycol dimethacrylate crosslinked copolymer sold under the name Ganzpearl PM 030 by the company Ganz Chemical;
- powder of polyallyl methacrylate/ethylene glycol dimethacrylate, for instance

- "Poly-Pore L200" or "Poly-Pore E200" sold by the company Amcol,
- powder of lauryl methacrylate/ethylene glycol dimethacrylate copolymer, for instance "Polytrap 6603" sold by the company Dow Corning;
- powder of acrylate/ethylhexyl acrylate copolymer, for instance "Techpolymer ACP-8C" sold by the company Sekisui Plastics;
- powder of acrylonitrile/methacrylate/vinylidene chloride copolymer sold under the name Expancel by the company Expancel under the references 551 DE 50, 551 DE 20, 551 DE 12, 551 DE 80, and 461 DE 50.

As the polyurethane powders, mention may be made of powders of crosslinked polyurethane comprising a copolymer, the said copolymer comprising trimethylol hexyl lactone, for instance the hexamethylene diisocyanate/trimethylol hexyl lactone polymer sold under the name Plastic Powder D-400® or Plastic Powder D-800® by the company Toshiki.

As the silicone powders, mention may be made of organopolysilsesquioxane powders, organopolysiloxane powders, and silicone resin powders.

The organopolysilsesquioxane powders are preferably polymethylsilsesquioxane powders. Materials sold by the company Momentive Performance Materials, under the tradename "TOSPEARL" and materials sold by NIKKO RICA under the name MSP-N050 and MSP-N080 are examples of such polymethylsilsesquioxane powders.

The organopolysiloxane powders may be elastomeric or non-elastomeric. It is preferable to use elastomeric organopolysiloxane powder or organopolysiloxane elastomer powder.

The elastomeric organopolysiloxane may, for example, be crosslinked and may be obtained via a crosslinking addition reaction of diorganopolysiloxane comprising at least one hydrogen linked to silicon and of diorganopolysiloxane comprising at least one ethylenically unsaturated group linked to silicon, preferably, in the presence of, for example, a platinum catalyst; or via a dehydrogenation crosslinking condensation reaction between a diorganopolysiloxane comprising at least one hydroxyl end group and a diorganopolysiloxane comprising at least one hydrogen linked to silicon, preferably, in the presence of, for example, an organotin compound; or via a crosslinking condensation reaction of a diorganopolysiloxane comprising at least one hydroxyl end group and of a hydrolysable organopolysilane; or via thermal crosslinking of organopolysiloxane, preferably, in the presence of, for example, an organoperoxide catalyst; or via crosslinking of organopolysiloxane by high-energy radiation such as gamma rays, ultraviolet rays or an electron beam.

Elastomer organopolysiloxane powders that may be used include those sold under the names "Dow Corning 9505 Powder" and "Dow Corning 9506 Powder" by the company Dow Corning. These powders have the INCI name: dimethicone/vinyl dimethicone crosspolymer.

The elastomeric organopolysiloxane powder may, for example, be chosen from elastomeric organopolysiloxane powders coated with silicone resin, for example, with silsesquioxane resin, as described, for example, in U.S. Patent No. 5,538,793, the content of which is incorporated by reference. Such elastomeric powders are sold under the names "KSP-100", "KSP-101", "KSP-102", "KSP-103", "KSP-104" and "KSP-105" by the company Shin-Etsu,

and have the INCI name: vinyl dimethicone/methicone silsesquioxane crosspolymer.

Other elastomeric organopolysiloxanes in the form of spherical powders may be powders of hybrid silicone functionalized with fluoroalkyl groups, sold, for example, under the name "KSP-200" by the company Shin-Etsu and powders of hybrid silicones functionalized with phenyl groups, sold, for example, under the name "KSP-300" by the company Shin-Etsu.

As the wax powders, mention may be made of carnauba microwaxes, such as the product sold under the name Micro Care 350® by the company Micro Powders, synthetic microwaxes, for example paraffin wax powders, such as the product sold under the name MicroEase 114S® by the company Micro Powders, microwaxes formed from a mixture of carnauba wax and polyethylene wax, such as those sold under the name of Micro Care 300® and 310® by the company Micro Powders, microwaxes formed from a mixture of carnauba wax and of synthetic wax, such as the product sold under the name Micro Care 325® by the company Micro Powders, and polyethylene microwaxes, such as those sold under the names Micropoly 200®, 220®, 220L® and 250S® by the company Micro Powders.

As the polyamide powders, mention may be made of those sold under the name "Orgasol" by the company Atochem. These polyamide powder particles are moreover known according to their various physicochemical properties under the name "Nylon 12" or "Nylon 6". The polyamide powders useful in the present invention may also include those sold under the name SP500 by the company TORAY.

In one specific embodiment of the present invention, the (c) powder is selected from amphiphilic powders, such as silica silylate.

The amount of the (c) powder(s) in the composition according to the present invention may be 0.001% by weight or more, preferably 0.01% by weight or more, more preferably 0.1% by weight or more, and even more preferably 0.2% by weight or more, relative to the total weight of the composition.

The amount of the (c) powder (s) in the composition according to the present invention may be 10% by weight or less, preferably 5% by weight or less, more preferably 3% by weight or less, and even more preferably 2% by weight or less, relative to the total weight of the composition.

Specifically, the amount of the (c) powder (s) in the composition according to the present invention may range from 0.001 to 10% by weight, preferably from 0.01 to 5% by weight, more preferably from 0.1 to 3% by weight, and even more preferably from 0.2 to 2% by weight, relative to the total weight of the composition.

(Water)

The composition according to the present invention comprises (d) water. In the present invention, water forms the aqueous phase.

The amount of water may be 10% by weight or more, preferably 20% by weight or more, and more preferably 25% by weight or more, relative to the total weight of the composition.

The amount of the water may be 70% by weight or less, preferably 60% by weight or less, and more preferably 50% by weight or less, relative to the total weight of the composition according to the present invention.

- 5 Specifically, the amount of the water in the composition according to the present invention may be from 10 to 70% by weight, preferably from 20 to 60% by weight, and more preferably from 25 to 50% by weight, relative to the total weight of the composition.

(Other Ingredients)

10

• Oil

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

15

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

20

The oil can form the oily phase of the composition according to the present invention.

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

25

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

30

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

35

As examples of animal oils, mention may be made of, for example, squalene and squalane.

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

40

The ester oils are preferably liquid esters of saturated or unsaturated, linear or branched C₁-C₂₆ aliphatic monoacids or polyacids and of saturated or unsaturated, linear or branched C₁-C₂₆ aliphatic monoalcohols or polyalcohols, the total number of carbon atoms of the esters being greater than or equal to 10.

45

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

50

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

Esters of C₄-C₂₂ dicarboxylic or tricarboxylic acids and of C₁-C₂₂ alcohols, and esters of monocarboxylic, dicarboxylic, or tricarboxylic acids and of non-sugar C₄-C₂₆ dihydroxy, trihydroxy, tetrahydroxy, or pentahydroxy alcohols may also be used.

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

As ester oils, one can use sugar esters and diesters of C₆-C₃₀ and preferably C₁₂-C₂₂ fatty acids. It is recalled that the term "sugar" means oxygen-bearing hydrocarbon-based compounds containing several alcohol functions, with or without aldehyde or ketone functions, and which comprise at least 4 carbon atoms. These sugars may be monosaccharides, oligosaccharides, or polysaccharides.

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

The sugar esters of fatty acids may be chosen especially from the group comprising the esters or mixtures of esters of sugars described previously and of linear or branched, saturated or unsaturated C₆-C₃₀ and preferably C₁₂-C₂₂ fatty acids. If they are unsaturated, these compounds may have one to three conjugated or non-conjugated carbon-carbon double bonds.

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

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

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

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

As examples of ether oils, mention may be made of, for example, ether oils with a short hydrocarbon chain or chains, such as dicaprylyl ether.

As examples of artificial triglycerides, mention may be made of, for example, capryl caprylyl glycerides, glyceryl trimyristate, glyceryl tripalmitate, glyceryl trilinolenate, glyceryl trilaurate, glyceryl tricaprinate, glyceryl tricaprylate, glyceryl tri(caprate/caprylate), and glyceryl tri(caprate/caprylate/linolenate).

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

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

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

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

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

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

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

Among the silicones containing aryl groups, mention may be made of polydiarylsiloxanes, especially polydiphenylsiloxanes and polyalkylarylsiloxanes such as phenyl silicone oil.

As the phenyl silicone oil, phenyl trimethicone is preferable.

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

Hydrocarbon oils may be chosen from:

- linear or branched, optionally cyclic, C₆-C₁₆ lower alkanes. Examples that may be mentioned include hexane, undecane, dodecane, tridecane, and isoparaffins, for instance isohexadecane, isododecane, and isodecane; and

- linear or branched hydrocarbons containing more than 16 carbon atoms, such as liquid paraffins, liquid petroleum jelly, polydecenes and hydrogenated polyisobutenes such as Parleam®, and squalane.

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

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

15 The fatty alcohol may have the structure R-OH wherein R is chosen from saturated and unsaturated, linear and branched radicals containing from 4 to 40 carbon atoms, preferably from 6 to 30 carbon atoms, and more preferably from 12 to 20 carbon atoms. In at least one embodiment, R may be chosen from C₁₂-C₂₀ alkyl and C₁₂-C₂₀ alkenyl groups. R may or may not be substituted with at least one hydroxyl group.

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

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

Thus, the fatty alcohol may be selected from straight or branched, saturated or unsaturated C₆-C₃₀ alcohols, preferably straight or branched, saturated C₆-C₃₀ alcohols, and more
30 preferably straight or branched, saturated C₁₂-C₂₀ alcohols.

The term “saturated fatty alcohol” here means an alcohol having a long aliphatic saturated carbon chain. It is preferable that the saturated fatty alcohol be selected from any linear or branched, saturated C₆-C₃₀ fatty alcohols. Among the linear or branched, saturated C₆-C₃₀
35 fatty alcohols, linear or branched, saturated C₁₂-C₂₀ fatty alcohols may preferably be used. Any linear or branched, saturated C₁₆-C₂₀ fatty alcohols may be more preferably used. Branched C₁₆-C₂₀ fatty alcohols may be even more preferably used.

40 As examples of saturated fatty alcohols, mention may be made of lauryl alcohol, cetyl alcohol, stearyl alcohol, isostearyl alcohol, behenyl alcohol, undecylenyl alcohol, myristyl alcohol, octyldodecanol, hexyldecanol, and mixtures thereof. In one embodiment, cetyl alcohol, stearyl alcohol, octyldodecanol, hexyldecanol, or a mixture thereof (e.g., cetearyl alcohol) as well as behenyl alcohol, can be used as a saturated fatty alcohol.

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

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

In one embodiment, it is preferable that the oil be selected from the group consisting of mineral oil, octyldodecanol, petrolatum, isododecane, hydrogenated polyisobutene, isopropyl myristate, isononyl isononanoate, dimethicone, cyclohexasiloxane, C₂₀-C₂₂ alcohol, cetyl palmitate, oleyl alcohol, cetyl alcohol, and mixtures thereof.

The amount of the oil in the composition according to the present invention may range from 5 to 60% by weight, preferably from 10 to 50% by weight, and more preferably from 15 to 40% by weight, relative to the total weight of the composition.

• Organic UV-A Filter

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

The organic UV-A filter may be hydrophilic and/or lipophilic, and preferably lipophilic.

The lipophilic organic UV-A filters used in the present invention may include, but are not limited to, aminobenzophenone compounds, dibenzoylmethane compounds, anthranilic acid compounds, and 4,4-diarylbutadiene compounds, and benzoxazole compounds.

As the aminobenzophenone compounds, mention may be made of n-hexyl 2-(4-diethylamino-2-hydroxybenzoyl)benzoate, the alternative name of which is diethylamino hydroxybenzoyl hexyl benzoate (DHHB), sold under the trade name "Uvinul A+" from BASF.

As the dibenzoylmethane compounds, mention may be made of 4-isopropylidibenzoylmethane, sold under the name of "Eusolex 8020" from Merck, 1-(4-methoxy-1-benzofuran-5-yl)-3-phenylpropane-1,3-dione, sold under the name of "Pongamol" from Quest, 1-(4-(tert-butyl)phenyl)-3-(2-hydroxyphenyl)propane-1,3-dione, and butyl methoxydibenzoylmethane, sold under the trade name "Parsol 1789" from Hoffmann-La Roche.

As the anthranilic acid compounds, mention may be made of menthyl anthranilate marketed under the name "NEO HELIPAN MA" by Symrise.

As the 4,4-diarylbutadiene compounds, mention may be made of 1,1-dicarboxy (2,2'-dimethylpropyl)-4,4-diphenylbutadiene and diphenyl butadiene malonates and malononitriles.

The hydrophilic organic UV-A filter includes, but is not limited to:

Terephthalylidene Dicamphor Sulfonic Acid and salts thereof, such as that manufactured under the name "Mexoryl SX" by Chimex,

Bisbenzoxazolyl derivatives, such as described in patents, EP 669 323 and US 2,463,264, more particularly the compound Disodium Phenyl Dibenzimidazole Tetrasulfonate and salts thereof, sold under the trade name "Neo Heliopan AP" by Haarmann and Reimer.

In one preferred embodiment of the present invention, the composition according to the present invention comprises at least one lipophilic organic UV-A filter and at least one hydrophilic organic UV-A filter in combination. The preferred lipophilic organic UV-A filter

includes dibenzoylmethane compounds, such as butyl methoxydibenzoylmethane. The preferred hydrophilic organic UV-A filter includes terephthalylidene dicamphor sulfonic acid.

In another preferred embodiment of the present invention, the composition according to the present invention comprises at least one lipophilic organic UV-A filter and at least one hydrophilic organic UV-A filter in combination with the (a) solid organic UV-B filter selected from triazine compounds and the (b) liquid organic UV-B filter selected from salicylic compounds, β,β -diphenylacrylate compounds, and mixtures thereof.

The amount of the organic UV-A filter in the composition according to the present invention may range from 0.1 to 20% by weight, preferably from 1 to 15% by weight, and more preferably from 2 to 10% by weight, relative to the total weight of the composition.

• Cosmetically Acceptable Hydrophilic Organic Solvent

The composition according to the present invention may comprise at least one cosmetically acceptable hydrophilic organic solvent. If two or more to these solvents are used, they may be the same or different.

The cosmetically acceptable hydrophilic organic solvent can form the aqueous phase of the composition according to the present invention.

The cosmetically acceptable hydrophilic organic solvent(s) may include, for example, substantially linear or branched lower mono-alcohols having from 1 to 8 carbon atoms, such as ethanol, propanol, butanol, isopropanol, and isobutanol; aromatic alcohols, such as benzyl alcohol and phenylethyl alcohol; polyols or polyol ethers, such as propylene glycol, dipropylene glycol, isoprene glycol, butylene glycol, glycerine, propanediol, caprylyl glycol, sorbitol, ethylene glycol monomethyl, monoethyl and monobutyl ethers, propylene glycol ethers, such as propylene glycol monomethylether, diethylene glycol alkyl ethers, such as diethylene glycol monoethylether or monobutylether; polyethylene glycols, such as PEG-4, PEG-6, and PEG-8, and their derivatives.

The amount of the cosmetically acceptable hydrophilic organic solvent(s) in the composition according to the present invention may range from 0.1% to 20% by weight, preferably from 1% to 15% by weight, and more preferably from 3% to 10% by weight, relative to the total weight of the composition.

• Adjuvants

The compositions according to the present invention may also contain various adjuvants conventionally used in compositions for sun care products, which may be selected from a physiologically acceptable medium, cationic, anionic, non-ionic, amphoteric or zwitterionic polymers, or mixtures thereof, cationic, anionic, non-ionic, amphoteric or zwitterionic surfactants or emulsifiers, or mixtures thereof, antioxidants, such as tocopherol, neutralizing agents, such as triethanolamine, sequestering agents, such as disodium EDTA, fragrances, emollients, in particular water soluble emollients of PEG modified silane and silicone, such as bis-PEG-18 methyl ether dimethyl silane, dispersing agents, dyes and/or pigments, film-forming agents and/or thickeners, ceramides, preservatives, such as phenoxy ethanol,

co-preservatives and opacifying agents.

In one preferred embodiment of the present invention, the composition according to the present invention comprises cationic, anionic, non-ionic, amphoteric or zwitterionic surfactants or emulsifiers in an amount of 3% by weight or less, preferably 2% by weight or less, and more preferably 1% by weight or less, relative to the total amount of the composition.

In one particular embodiment of the present invention, the composition according to the present invention is free of any kind of surfactant or emulsifier.

In one preferred embodiment of the present invention, the composition according to the present invention comprises inorganic UV filter(s) in an amount of 3% by weight or less, preferably 2% by weight or less, and more preferably 1% by weight or less, relative to the total amount of the composition.

In one particular embodiment of the present invention, the composition according to the present invention is free of any kind of inorganic UV filters. Generally, inorganic UV filters have an average particle size of lower than 200 nm and include, for example, titanium dioxide, zinc oxide, and cerium oxide.

The adjuvants may be present in the composition of the present invention in an amount preferably ranging from 0.01% to 30% by weight, preferably from 0.1% to 20% by weight, and more preferably from 1% to 10% by weight, relative to the total weight of the composition.

[Preparation]

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

The method and means to mix the above essential and optional ingredients are not limited. Any conventional method and means can be used to mix the above essential and optional ingredients to prepare the composition according to the present invention. In general, the aqueous phase and the oily phase are prepared separately, and then they are mixed to prepare the composition according to the present invention. The mix ratio of the aqueous phase and the oily phase is not particularly limited, but generally from 1:5 to 5:1, preferably from 1:3 to 3:1, and more preferably from 1:2 to 2:1. It is also possible to heat the ingredients, for example, to 50 to 90°C, to ensure that they are dissolved completely during the method.

[Cosmetic Process]

The composition according to the present invention may preferably be used as a cosmetic composition. The cosmetic composition may be a sun care composition for protecting keratinous substances, such as skin, from UV rays.

Therefore, the present invention relates to a cosmetic process for protecting keratinous substances from UV radiation, comprising, at least one step of applying the composition according to the present invention to the keratinous substance, such as skin. The process according to the present invention can further comprise another step of mixing the aqueous

phase and the oily phase of the present invention prior to the application on the keratinous substance, so as to be a homogenous composition.

[Product]

The present invention also relates to a cosmetic product comprising the composition according to the present invention. The product according to the present invention comprises the composition according to the present invention and a container or a package in which the composition is contained.

The composition of the present invention is sprayable or, in other words, capable of being dispensed in the form of fine particles or mist. This means that the composition may be dispensed using a dispenser having a spray nozzle.

Accordingly, the present invention also relates to a product comprising a container and a spray nozzle, wherein said container contains the composition of the invention.

The compositions of the invention may be applied with any container with spraying means, including suitable aerosol or non-aerosol spray devices. Since the composition according to the present invention has a relatively low viscosity, there is a benefit in that the composition can be applied without using an aerosol spray device. Therefore, non-aerosol spray devices are preferred, and include for example, mist pumps or spray pumps such as the following: Eurogel Spray Pump (available from Seqquist Perfect, Cary Ill.), P1 spray pump (available from Precision, Ajax, Canada), Calmar Spray Pumps, Calmar, Inc., City of Industry, Calif, and Mitani Mist Pumps (available from MITANI VALVE CO.,LTD).

In one specific embodiment of the present invention, the present invention relates to a product comprising:

a container comprising the composition according to the present invention;
an outlet connected to the container, such as an outlet of a spray nozzle; and
a spray-device,
wherein
the spray-devices capable of discharging the composition in the container via the outlet.

In this embodiment, the container can be a bottle, a tube, or a vessel.

EXAMPLES

The present invention will be described in a more detailed manner by way of examples. However, these examples should not be construed as limiting the scope of the present invention.

[Compositions]

Each of the compositions according to Examples 1 to 12 (Ex. 1 to Ex. 12) and Comparative Examples 1 to 5 (Comp. Ex. 1 to Comp. Ex. 5) was prepared by mixing the ingredients shown in Tables 1 to 3. The compositions are shown in the following Tables 1 to 3. The numerical values for the amounts of the ingredients are all based on “% by weight” as active raw materials.

[Evaluation]

(Film Homogeneity)

Each of the compositions was shaken 10 times in a capped container to be homogeneous.

- 5 Each of the homogenous compositions was applied to a polypropylene sheet (thickness: 0.2 mm, PX-P from Sekisui Kagaku) using an applicator called "Elecometer 4340" with a force of 1kgf, so as to obtain a 10 μ m coating of the composition on the sheet. The sheet was then exposed to a UV lamp (UV black ray B-100AP, wave length: 365nm) and a picture was taken. The film homogeneity was evaluated based on the visual appearance of the coated sheet in
- 10 five grades (Very Good, Good, Fair, Bad, and Very Bad). If the appearance was homogeneous intensive black, it was ranked as "Very Good". If the appearance was non-homogenous blue translucent, it was ranked as "Very Bad".

(SPF)

- 15 Each of the compositions was shaken 10 times in a capped container to be homogeneous. Each of the homogenous compositions was transferred onto a plate (Helio plate HD 6, PMMA, roughness: 6 μ m) with an adjustable pipette in an amount of 0.8 mg/cm² of the plate and then uniformly spread by the fingers. The coated plate was air dried for 15 minutes at room temperature. The obtained sample plate was placed into a Labsphere Ultraviolet
- 20 Transmittance Analyzer (Model UV-2000 from Solar Light Company, Philadelphia, Pennsylvania). Irradiation took place at 12 points on the sample plate. The in vitro SPF level was calculated by Labsphere using COLIPA method.

(Formula Structure)

- 25 Each of the compositions was shaken 10 times in a capped container to be homogeneous, and then they were left for at least 30 minutes at room temperature. The appearance of each of the compositions was observed with the naked eye to determine a formula structure.

(Mist Quality)

- 30 Each of the compositions was shaken 10 times in a spray bottle to be homogeneous. The mist quality of each of the homogeneous compositions was evaluated visually based on its sprayed droplet size and spray angle. If the sprayed droplet size was fine and the spray angle was wide, it was scored as "Good". If the sprayed droplet size was big and the spray angle was narrow, it was scored as "Bad". In this evaluation, ALBEA mechanical pump was used
- 35 as a standard spray bottle.

(Stability)

- The stability of each of the compositions was evaluated in terms of formation of crystals. The appearances of each of the compositions was observed with the naked eye after storage
- 40 for 2 months at 45 degree. If the visual bi-phase aspect didn't change at all and no crystalline was not formed in the composition, it was evaluated as "OK". If the visual bi-phase aspect changed or a crystalline was formed in the composition after the storage, it was evaluated as "NG".

- 45 The evaluation results are summarized in Table 4 below.

Table 1

	Ingredients	Ex. 1	Ex. 2	Ex. 3	Ex. 4	Ex. 5	Ex. 6
Aqueous Phase	Water	qs 100	qs 100	qs 100	qs 100	qs 100	qs 100
	Disodium EDTA	0.05	0.05	0.05	0.05	0.05	0.05
	Phenoxyethanol	0.5	0.5	0.5	0.5	0.5	0.5
	Bis-PEG-18 Methyl Ether Dimethyl Silane	0.5	0.5	0.5	0.5	0.5	0.5
	Glycerin	3	3	3	3	3	3
	Caprylyl Glycol	0.15	0.15	0.15	0.15	0.15	0.15
	Terephthalylidene Dicamphor Sulfonic Acid	2	2	2	2	2	2
	Ethanol	4	3	4	4	4	4
	Triethanolamine	0.34	0.34	0.34	0.34	0.34	0.34
Oily Phase	Butyl Methoxydibenzoylmethane	3	3	3	3	3	3
	Ethylhexyl Salicylate	2	2	2	2	2	2
	Ethylhexyl Triazone	1	1	1	1	1	1
	Octocrylene	5	5	5	5	5	5
	Homosalate	3	3	3	3	3	3
	Dimethicone	10.1	10.1	10.1	10.1	10.1	10.1
	Dicaprylyl Carbonate	10	10	10	10	10	10
Powder	Vinyl Dimethicone / Methicone Silsesquioxane Crosspolymer (4.3 μm)*	1	-	-	-	-	-
	Polymethylsilsesquioxane (4.6 μm)*	-	1	-	-	-	-
	Silica Silylate (9.8 μm)*	-	-	1	-	-	-
	Nylon-12 (9.0 μm)*	-	-	-	1	-	-
	Polymethylmethacrylate (7.5 μm)*	-	-	-	-	1	-
	Silica (5.1 μm)*	-	-	-	-	-	1

* average particle size

Table 2

	Ingredients	Ex. 7	Ex. 8	Ex. 9	Ex. 10	Ex. 11	Ex. 12
Aqueous Phase	Water	qs 100	qs 100	qs 100	qs 100	qs 100	qs 100
	Disodium EDTA	0.05	0.05	0.05	0.05	0.05	0.05
	Phenoxyethanol	0.5	0.5	0.5	0.5	0.5	0.5
	Bis-PEG-18 Methyl Ether Dimethyl Silane	0.5	0.5	0.5	0.5	0.5	0.5
	Glycerin	3	3	3	3	3	3
	Caprylyl Glycol	0.15	0.15	0.15	0.15	0.15	0.15
	Terephthalylidene Dicamphor Sulfonic Acid	2	2	2	2	2	2
	Ethanol	4	3	4	4	4	4
	Triethanolamine	0.34	0.34	0.34	0.34	0.34	0.34
Oily Phase	Butyl Methoxydibenzoylmethane	3	3	3	3	3	3
	Ethylhexyl Salicylate	2	2	2	2	2	-
	Ethylhexyl Triazone	1	1	1	1	1	1
	Octocrylene	5	5	5	5	5	5
	Homosalate	3	3	3	3	-	3
	Dimethicone	10.1	10.1	10.1	10.1	10.1	10.1
	Dicaprylyl Carbonate	10	10	10	10	10	10
Powder	Silica Silylate (9.8 μm)*	-	-	-	-	1	1
	Cellulose (4.0 μm)*	1	-	-	-	-	-
	Paraffin Wax (6.2 μm)*	-	1	-	-	-	-
	Boron Nitride (6.7 μm)*	-	-	1	-	-	-
	Acrylates / Ethylhexyl Acrylate Crosspolymer (8.6 μm)*	-	-	-	1	-	-

* average particle size

Table 3

	Ingredients	Comp. Ex. 1	Comp. Ex. 2	Comp. Ex. 3	Comp. Ex. 4	Comp. Ex. 5
Aqueous Phase	Water	qs 100	qs 100	qs 100	qs 100	qs 100
	Disodium EDTA	0.05	0.05	0.05	0.05	0.05
	Phenoxyethanol	0.5	0.5	0.5	0.5	0.5
	Bis-PEG-18 Methyl Ether Dimethyl Silane	0.5	0.5	0.5	0.5	0.5
	Glycerin	3	3	3	3	3
	Caprylyl Glycol	0.15	0.15	0.15	0.15	0.15
	Terephthalylidene Dicamphor Sulfonic Acid	2	2	2	2	2
	Ethanol	4	3	4	4	4
	Triethanolamine	0.34	0.34	0.34	0.34	0.34
Oily Phase	Butyl Methoxydibenzoylmethane	3	3	3	3	3
	Ethylhexyl Salicylate	2	2	2	2	2
	Ethylhexyl Triazone	1	1	1	1	-
	Octocrylene	5	5	5	5	5
	Homosalate	3	3	3	3	3
	Dimethicone	10.1	10.1	10.1	10.1	10.1
	Dicaprylyl Carbonate	10	10	10	10	10
Powder	Silica Silylate (9.8 μm)*	-	-	-	-	1
Surfactant	PEG-10 Dimethicone	1	-	-	-	-
	Polyglyceryl-6 Polyricinoleate	-	1	-	-	-
	Steareth-10	-	-	1	-	-

* average particle size

Table 4

Evaluation	Ex. 1	Ex. 2	Ex. 3	Ex. 4	Ex. 5	Ex. 6	Ex. 7	Ex. 8	Ex. 9
Film Homogeneity	Very Good	Very Good	Very Good	Very Good	Very Good	Very Good	Very Good	Very Good	Very Good
SPF value	30	30	30	30	30	30	30	30	30
Formula Structure	Bi-phase	Bi-phase	Bi-phase	Bi-phase	Bi-phase	Bi-phase	Bi-phase	Bi-phase	Bi-phase
Mist Quality	Good	Good	Good	Good	Good	Good	Good	Good	Good
Stability	OK	OK	OK	OK	OK	OK	OK	OK	OK

Evaluation	Ex. 10	Ex. 11	Ex. 12	Comp. Ex. 1	Comp. Ex. 2	Comp. Ex. 3	Comp. Ex. 4	Comp. Ex. 5
Film Homogeneity	Very Good	Very Good	Very Good	Fair	Fair	Fair	Bad	Very Good
SPF value	30	27	27	15	15	15	10	20
Formula Structure	Bi-phase	Bi-phase	Bi-phase	Emulsion	Emulsion	Emulsion	Bi-phase	Bi-phase
Mist Quality	Good	Good	Good	Bad	Bad	Bad	Good	Good
Stability	OK	OK	OK	OK	OK	OK	OK	OK

As can be seen from Table 4, the compositions according to each of Examples 1 to 12, which include the specific combination of the ingredients (a) to (d) of the present invention exhibited a good film homogeneity and thus a high in-vitro SPF value. In addition, they show a good mist quality and stability.

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On the other hand, each of the compositions according to Comparative Examples 1 to 4, which lack the powder of the present invention, showed inferior film homogeneity and thus a low SPF value. In addition, each of the compositions according to Comparative Examples 1 to 3 did not show a good mist quality. Furthermore, the composition according to

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Comparative Example 5, which lacks a solid organic UV filter, showed a low SPF value.

Therefore, it can be concluded that the composition according to the present invention can be very preferable as a sun care composition, since it has a strong UV protecting effect due to a high in vitro SPF level. In addition, since the mixed homogenous composition of the present

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invention has a relatively low viscosity, it can be easily applied onto keratinous substances and can be very useful for consumers.

CLAIMS

1. A bi-phase composition comprising an aqueous phase and an oily phase, wherein the composition comprises:
 - (a) at least one solid organic UV-B filter,
 - (b) at least one liquid organic UV-B filter,
 - (c) at least one powder, and
 - (d) water.
2. The composition according to Claim 1, wherein the (a) solid organic UV-B filter comprises triazine compounds selected from ethylhexyl triazone, diethylhexyl butamido triazone, 2,4,6-tris(dineopentyl 4'-aminobenzalmalonate)-s-triazine, 2,4,6-tris(diisobutyl 4'-aminobenzalmalonate)-s-triazine, 2,4-bis(dineopentyl 4'-aminobenzalmalonate)-6-(n-butyl 4'-aminobenzoate)-s-triazine, 2,4-bis(n-butyl 4'-aminobenzoate)-6-(aminopropyltrisiloxane)-s-triazine, bis-ethylhexyloxyphenol methoxyphenyl triazine, and mixtures thereof.
3. The composition according to Claim 1 or 2, wherein the (b) liquid organic UV-B filter is selected from salicylic compounds, β,β -diphenylacrylate compounds, and mixtures thereof.
4. The composition according to any one of the preceding claims, wherein the composition comprises the (a) solid organic UV-B filter selected from triazine compounds and the (b) liquid organic UV-B filter selected from salicylic compounds, β,β -diphenylacrylate compounds, and mixtures thereof.
5. The composition according to any one of the preceding claims, wherein the (c) powder comprises inorganic powders selected from mica, silica, magnesium aluminium silicate, trimethyl siloxysilicate or silica silylate, kaolin, bentone, calcium carbonate, magnesium hydrogen carbonate, hydroxyapatite, boron nitride, fluorphlogopite, sericite, calcinated talc, calcinated mica, calcinated sericite, synthetic mica, perlite, lauroyl lysine, metal soap, bismuth oxychloride, barium sulfate, magnesium carbonate, and mixtures thereof.
6. The composition according to any one of Claims 1 to 4, wherein the (c) powder comprises organic powders selected from acrylic polymer powders, silicone powders, wax powders, polyamide powders, urethane polymer powders, tetrafluoroethylene polymer powders, polyacrylonitrile powders, poly- β -alanine powders, polyethylene powders, polytetrafluoroethylene powders, lauroyllysine, starch, cellulose powder, tetrafluoroethylene polymer powders, and mixtures thereof.
7. The composition according to any one of the preceding claims, wherein the amount of the (a) solid organic UV filter(s) ranges from 0.01 to 15% by weight, preferably from 0.05 to 10% by weight, and more preferably from 0.1 to 5% by weight, relative to the total weight of the composition.
8. The composition according to any one of the preceding claims, wherein the amount of the (b) liquid organic UV filter(s) ranges from 0.1 to 30% by weight, preferably from 1 to 20% by weight, and more preferably from 3 to 15% by weight, relative to

the total weight of the composition.

9. The composition according to any one of the preceding claims, wherein the amount of the (c) powder (s) ranges from 0.001 to 10% by weight, preferably from 0.01 to 5% by weight, more preferably from 0.1 to 3% by weight, and even more preferably from 0.2 to 2% by weight, relative to the total weight of the composition.
10. The composition according to any one of the preceding claims, comprising at least one organic UV-A filter.
11. The composition according to any one of the preceding claims, comprising cationic, anionic, non-ionic, amphoteric or zwitterionic surfactants or emulsifiers in an amount of 3% by weight or less, preferably 2% by weight or less, and more preferably 1% by weight or less, relative to the total amount of the composition, or being free of any kind of surfactant or emulsifier.
12. The composition according to any one of the preceding claims, comprising inorganic UV filters in an amount of 3% by weight or less, preferably 2% by weight or less, and more preferably 1% by weight or less, relative to the total amount of the composition, or being free of any kind of inorganic UV filter.
13. The composition according to any one of the preceding claims, wherein the composition has two layers of the aqueous phase and the oily phase at rest.
14. A cosmetic process for protecting keratinous substances, preferably skin, from UV radiation, comprising a step of applying the composition according to any one of the preceding claims to the keratinous substances.
15. A product comprising a container and a spray nozzle, wherein the container comprises the composition according to any one of Claims 1 to 13.

INTERNATIONAL SEARCH REPORT

International application No
PCT/JP2019/048365

A. CLASSIFICATION OF SUBJECT MATTER INV. A61K8/03 A61K8/37 A61K8/40 A61Q17/04 A61K8/49 ADD.								
According to International Patent Classification (IPC) or to both national classification and IPC								
B. FIELDS SEARCHED Minimum documentation searched (classification system followed by classification symbols) A61K A61Q Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched Electronic data base consulted during the international search (name of data base and, where practicable, search terms used) EPO-Internal, WPI Data								
C. DOCUMENTS CONSIDERED TO BE RELEVANT <table border="1"> <thead> <tr> <th>Category*</th> <th>Citation of document, with indication, where appropriate, of the relevant passages</th> <th>Relevant to claim No.</th> </tr> </thead> <tbody> <tr> <td>X</td> <td> DATABASE GNPD [Online] MINTEL; 27 February 2018 (2018-02-27), anonymous: "Hydro UV Genius UV & IR SPF 50+/PA++++", XP055669352, retrieved from www.gnpd.com Database accession no. 5490475 the whole document ----- -/-- </td> <td>1-15</td> </tr> </tbody> </table>			Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.	X	DATABASE GNPD [Online] MINTEL; 27 February 2018 (2018-02-27), anonymous: "Hydro UV Genius UV & IR SPF 50+/PA++++", XP055669352, retrieved from www.gnpd.com Database accession no. 5490475 the whole document ----- -/--	1-15
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Date of the actual completion of the international search		Date of mailing of the international search report						
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Name and mailing address of the ISA/ European Patent Office, P.B. 5818 Patentlaan 2 NL - 2280 HV Rijswijk Tel. (+31-70) 340-2040, Fax: (+31-70) 340-3016		Authorized officer						
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C(Continuation). DOCUMENTS CONSIDERED TO BE RELEVANT		
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Information on patent family members

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