

SPECIFICATION

SKIN COSMETIC COMPOSITION

5 FIELD OF THE INVENTION

[0001]

The present invention relates to a skin cosmetic composition.

BACKGROUND

10 [0002]

Technologies for protecting against ultraviolet rays employing cosmetic compositions are described in Patent Documents 1 to 3.

Patent Document 1 (Japanese Patent Laid-Open No. H11-343,224
15 (1999)) describes cosmetic compositions, which is prepared by filling a pressure vessel with a composition for an aerosol containing ethanol and a specific compound.

[0003]

Patent Document 2 (Japanese Patent Laid-Open No. 2012-
20 140,342) describes a technology related to an oil-in-water type emulsified sunscreen cosmetic composition containing acrylate-alkyl methacrylate copolymer, a specific block type alkylene oxide derivative, an ultraviolet absorber, an oil content and water. This also describes that an oil-in-water type emulsified sunscreen
25 cosmetic composition having an enhanced stability and an enhanced feel of use is obtainable by blending block type alkylene oxide derivative having specific structure.

[0004]

Patent Document 3 (Japanese Patent Laid-Open No. H09-227,331 (1997)) describes an ultraviolet protective cosmetic composition containing an ultraviolet protective agent and poly(N-acyl
5 alkyleneimine)-modified silicone.

RELATED DOCUMENTS

PATENT DOCUMENTS

[0005]

10 [Patent Document 1]

Japanese Patent Laid-Open No. H11-343,224 (1999)

[Patent Document 2]

Japanese Patent Laid-Open No. 2012-140,342

[Patent Document 3]

15 Japanese Patent Laid-Open No. H09-227,331 (1997)

SUMMARY OF THE INVENTION

[0006]

According to one aspect of the present invention, there is
20 provided a skin cosmetic composition, containing the following components (A), (B), (C), (D1), (D2) and (E):

(A) an ultraviolet protective agent;

(B) a polymer containing constitutional units of a hydrophilic segment having an N-acyl alkyleneimine as its
25 repeating unit and an organo polysiloxane segment;

(C) an alcohol having carbon atom(s) of equal to or larger than 1 and equal to or smaller than 4;

(D1) a powder having number average particle size of equal to or larger than 1 μm and equal to or smaller than 10 μm ;

(D2) a powder having number average particle size of larger than 10 μm and equal to or smaller than 25 μm ; and

5 (E) a propellant,

wherein a content of the component (C) in all components of the skin cosmetic composition except the component (E) is equal to or higher than 40 % by mass and equal to or lower than 95 % by mass, and

10 wherein mass ratio of the component (D1) to the component (D2) in the skin cosmetic composition is presented as:
(Component (D1)/Component (D2)) = 1/2 to 20/1.

DETAILED DESCRIPTION OF THE INVENTION

15 [0007]

It was found according to the investigations of the present inventors that larger amount of ethanol is incorporated in the cosmetic composition as in the technology described in Patent Document 1, such that a preferable usability is obtainable, in
20 terms of obtaining spread feel and enhanced cool feel, but a persistence of the ultraviolet protective effect is poor, which indicates that there is a room for the improvements.

[0008]

Therefore, the present invention provides a skin cosmetic
25 composition that can exhibit an enhanced redispersibility of a powder, while balancing competing two effects, namely the persistence of the ultraviolet protective effect and an

improvement in the feel of use, such as a reduction of a stickiness to provide a smooth and dry feel.

[0009]

According to the present invention, it can provide a skin cosmetic composition that can exhibit the enhanced redispersibility of powder, while balancing the competing two effects, namely the persistence of the ultraviolet protective effect and the improvement in the feel of use, such as the reduction of the stickiness to provide the smooth and dry feel.

[0010]

In the present embodiment, a skin cosmetic composition is a composition containing the following components (A), (B), (C), (D1), (D2) and (E):

(A) an ultraviolet protective agent;

(B) a polymer containing constitutional units of a hydrophilic segment having an N-acyl alkyleneimine as its repeating unit and an organo polysiloxane segment;

(C) an alcohol having carbon atom(s) of equal to or larger than 1 and equal to or smaller than 4;

(D1) a powder having number average particle size of equal to or larger than 1 μm and equal to or smaller than 10 μm ;

(D2) a powder having number average particle size of larger than 10 μm and equal to or smaller than 25 μm ; and

(E) a propellant.

Further, a content of the component (C) in all components of the skin cosmetic composition except the component (E) is equal to or higher than 40 % by mass and equal to or lower than 95 % by

mass, and a mass ratio of the component (D1) to the component (D2) in the skin cosmetic composition is presented as: (Component (D1)/Component (D2)) = 1/2 to 20/1.

[0011]

5 Each of the components will be explained below, in reference to the specific embodiments. Here, each of these components may be employed alone, or a combination of two or more of these may also be employed.

In addition, the feel of use in the present embodiment means
10 a condition, in which smooth and dry feel is achieved without stickiness when the cosmetic composition is used.

[0012]

(Component (A))

The component (A) is an ultraviolet protective agent. Any
15 one of generally-used ultraviolet scattering agents and organic ultraviolet absorbing agents may be preferably employed for the component (A). Among these, specific examples of ultraviolet scattering agents may include: titanium oxide, fine particulate titanium oxide (that described in Japanese Patent Laid-Open No.
20 S57-67,681(1982) and the like), zinc oxide, fine zinc oxide (that described in Japanese Patent Laid-Open No. S62-228,006(1987) and the like), flakiness zinc oxide (that described in Japanese Patent Laid-Open No. H01-175,921 (1989) and the like), iron oxide, particulate iron oxide, cerium oxide, zirconium oxide and the like,
25 these having a number average particle diameter of, for example equal to or larger than 1 nm, preferably equal to or larger than 10 nm, and more preferably equal to or larger than 30 nm, and on

the other hand, for example equal to or smaller than 500 nm, preferably equal to or smaller than 300 nm, and more preferably equal to or smaller than 200 nm, and these may be surface-treated with silicone, metallic soap, N-acyl glutamic acid, perfluoroalkyl phosphate and the like. Geometries and morphologies of these are not limited, and these may be used in the form of sol or the like. [0013]

In addition, an oil-soluble compound is preferable for the organic ultraviolet absorbing agent, and this includes a benzoic acid-based ultraviolet absorbing agent, an anthranilic acid-based ultraviolet absorbing agent, a salicylic acid-based ultraviolet absorbing agent, a cinnamic acid-based ultraviolet absorbing agent, a benzophenone-based ultraviolet absorbing agent, a triazine-based ultraviolet absorbing agent and the like.

Typical benzoic acid-based ultraviolet absorbing agent includes paraaminobenzoic acid (hereinafter abbreviated as PABA), glyceryl PABA, ethyl dihydroxypropyl PABA, N-ethoxylate PABA ethyl ester, N-dimethyl PABA ethyl ester, N-dimethyl PABA butyl ester, N-dimethyl PABA amyl ester, octyldimethyl PABA, diethylamino hydroxybenzoyl hexyl benzoate and the like. In view of suppressing the stickiness while enhancing the ultraviolet absorption effect, paraaminobenzoic acid and diethylamino hydroxybenzoyl hexyl benzoate are preferable, and diethylamino hydroxybenzoyl hexyl benzoate is more preferable.

Typical anthranilic acid-based ultraviolet absorbing agent includes homomenthyl-N-acetyl anthranilate and the like.

Typical salicylic acid-based ultraviolet absorbing agent

includes amyl salicylate, menthyl salicylate, homomenthyl salicylate, octyl salicylate, phenyl salicylate, benzyl salicylate, p-isopropanol phenyl salicylate and the like.

Typical cinnamic acid-based ultraviolet absorbing agent
 5 includes octyl cinnamate, ethyl-4-isopropyl cinnamate, ethyl-2,4-diisopropyl cinnamate, methyl-2,4-diisopropyl cinnamate, propyl-p-methoxycinnamate, isopropyl-p-methoxycinnamate, isoamyl-p-methoxycinnamate, 2-ethylhexyl-p-methoxycinnamate, 2-ethoxyethyl-p-methoxycinnamate, cyclohexyl-p-methoxycinnamate, ethyl- α -cyano-
 10 β -phenyl cinnamate, 2-ethylhexyl- α -cyano- β -phenyl cinnamate, glyceryl mono-2-ethylhexanoyl diparamethoxy cinnamate and the like. Among these, in view of suppressing the stickiness while enhancing the ultraviolet absorption effect, octyl cinnamate and 2-ethylhexyl-p-methoxycinnamate are preferable, and 2-ethylhexyl-p-
 15 methoxycinnamate is more preferable.

Typical benzophenone-based ultraviolet absorbing agent includes 2,4-dihydroxybenzophenone, 2,2'-dihydroxy-4-methoxybenzophenone, 2,2'-dihydroxy-4,4'-dihydroxybenzophenone, 2-hydroxy-4-methoxybenzophenone, 2-hydroxy-4-methoxy-4'-
 20 methylbenzophenone, 2-hydroxy-4-methoxybenzophenone, 4-phenyl benzophenone, 2-ethylhexyl-4'-phenyl benzophenone-2-carboxylate, 2-hydroxy-4-n-octoxy benzophenone, 4-hydroxy-3-carboxy benzophenone and the like.

Typical triazine-based ultraviolet absorbing agent includes
 25 2,4,6-tris[4-(2-ethylhexyl oxycarbonyl) anilino]-1,3,5-triazine, 2,4-bis-[[4-(2-ethylhexyloxy)-2-hydroxy}-phenyl]-6-(4-methoxyphenyl)-1,3,5-triazine and the like.

Other compounds include 3-(4'-methylbenzylidene)-dl-camphor, 3-benzylidene-dl-camphor, ethyl urocanate ester, 2-phenyl-5-methyl benzoxazole, 2,2'-hydroxy-5-methylphenyl benzotriazole, 2-(2'-hydroxy-5-t-octylphenyl) benzotriazole, dibenzalazine, dianisoylmethane, 4-methoxy-4'-t-butyl dibenzoylmethane, 5-(3,3-dimethyl-2-norbornylidene)-3-pentane-2-one, benzene bis-1,3-diketone derivatives described in Japanese Patent Laid-Open No. H02-212,579 (1990), benzoylpinacolone derivatives described in Japanese Patent Laid-Open No. H03-220,153 (1991), and the like.

10 [0014]

In view of suppressing the stickiness while enhancing the ultraviolet protection effect, the component (A) preferably contains at least one selected from the benzoic acid-based ultraviolet absorbing agent, the benzophenone-based ultraviolet absorbing agents, the cinnamic acid-based ultraviolet absorbing agent and the triazine-based ultraviolet absorbing agent, and more preferably contains at least one selected from the benzoic acid-based ultraviolet absorbing agent, the cinnamic acid-based ultraviolet absorbing agent and the triazine-based ultraviolet absorbing agent, and further preferably contains at least two selected from the benzoic acid-based ultraviolet absorbing agent, the cinnamic acid-based ultraviolet absorbing agent and the triazine-based ultraviolet absorbing agent.

[0015]

25 One of, or a combination of two or more of the ultraviolet protective agent(s) of the component (A) may be employed, and the selection for the combination and the blending amount thereof may

be determined depending upon, for example, the ultraviolet protective effect of the skin cosmetic composition. In view of more considerably producing ultraviolet protective effect of the skin cosmetic composition, the content of the component (A) is, for example, equal to or higher than 0.1 % by mass in all components of the skin cosmetic composition except the component (E), and is preferably equal to or higher than 1% by mass, and is more preferably equal to or higher than 5 % by mass, and is further preferably equal to or higher than 10 % by mass. On the other hand, in view of providing improved feel of use of the skin cosmetic composition, or more specifically in view of suppressing the stickiness and providing smooth and dry feel, the content of the component (A) is, for example, equal to or lower than 30 % by mass, in all components of the skin cosmetic composition except the component (E), and is preferably equal to or lower than 25 % by mass, and is more preferably equal to or lower than 20 % by mass, and is further preferably equal to or lower than 18% by mass. [0016]

Also, when a combination of diethylamino hydroxybenzoyl hexyl benzoate and 2-ethylhexyl-p-methoxycinnamate is employed for the component (A), a ratio of 2-ethylhexyl-p-methoxycinnamate to diethylamino hydroxybenzoyl hexyl benzoate is, for example, equal to or lower than 10/1 according to the mass ratio (2-ethylhexyl-p-methoxycinnamate/diethylamino hydroxybenzoyl hexyl benzoate), in view of controlling the stickiness and in view of further producing ultraviolet protective effect, and is preferably equal to or lower than 8/1, and is more preferably equal to or lower

than 7/1 and on the other hand is for example, equal to or higher than 2/1, and is preferably equal to or higher than 3/1, and is more preferably equal to or higher than 4/1.

[0017]

5 (Component (B))

The component (B) is a polymer containing constitutional units of a hydrophilic segment having an N-acyl alkyleneimine as its repeating unit and an organo polysiloxane segment.

[0018]

10 In the component (B), a mass ratio of the organo polysiloxane segments to the hydrophilic segments having the N-acyl alkyleneimine as its repeating unit (organo polysiloxane segments a / hydrophilic segments b having N-acyl alkyleneimine as its repeating unit) is for example, a/b = equal to or higher than
15 45/55, in view of providing improved balance between the persistence of the ultraviolet protective effect and the suppression of the stickiness of the cosmetic composition, and is preferably equal to or higher than 65/35, and is more preferably equal to or higher than 85/15, and on the other hand is for
20 example, equal to or lower than 94/6, and is preferably equal to or lower than 92/8, and is more preferably equal to or lower than 90/10.

Here, the above-described mass ratio employed in the present specification means a value derived from an integral ratio between
25 an alkyl group or a phenyl group in the organo polysiloxane segment and a methylene group in the poly(N-acyl alkyleneimine) segment by nuclear magnetic resonance ($^1\text{H-NMR}$) analysis, in which

the organo polysiloxane of the present invention is dissolved in deuterated chloroform at 5 % by mass.

[0019]

In the component (B), a weight average molecular weight of the organo polysiloxane segment is, for example, equal to or higher than 1×10^4 , in view of providing an improved persistence of the ultraviolet protective effect of the cosmetic composition, in view of suppressing the stickiness, in view of providing an improved spreadability of the cosmetic composition and in view of providing an improved compatibility with the organic ultraviolet absorbing agent, and is preferably equal to or higher than 2×10^4 , and is more preferably equal to or higher than 3.5×10^4 , and on the other hand, is for example, equal to or lower than 3×10^5 , and is preferably equal to or lower than 2×10^5 , and is further preferably equal to or lower than 1.5×10^5 .

In addition to above, since a skeleton of organo polysiloxane constituting the principal chain is in common with a skeleton of its raw material compound that is a modified organo polysiloxane, the weight average molecular weight of the organo polysiloxane constituting the principal chain is approximately identical to the average molecular weight of the modified organo polysiloxane.

Here, the weight average molecular weight of the modified organo polysiloxane is a weight average molecular weight in the form of polystyrene conversion measured by gel permeation chromatography (GPC) under the following conditions.

Column: Super HZ4000 + Super HZ2000 (commercially available from

TOSOH CORPORATION);

Eluant: 1 mM triethylamine/THF;

Flow rate: 0.35 mL/min.;

Column temperature: 40 degrees C;

5 Detector: UV detector;

Sample: 50 μ L.

[0020]

Also, in the component (B), a number average molecular weight of the poly(N-acyl alkyleneimine) segment is for example, equal to or higher than 5×10^2 , in view of providing the improved persistence of the ultraviolet protective effect of the cosmetic composition, in view of suppressing the stickiness, in view of providing the improved spreadability of the cosmetic composition, in view of providing the improved compatibility with the organic ultraviolet absorbing agent, and in view of enhancing both a flexibility of a coating of the cosmetic composition and a solubility to the solvent, and is preferably equal to or higher than 7×10^2 , and is more preferably equal to or higher than 8×10^2 , and on the other hand is, for example, equal to or lower than 4×10^3 , and is preferably equal to or lower than 3.5×10^3 , and is more preferably equal to or lower than 3×10^3 .

While the number average molecular weight of poly(N-acyl alkyleneimine) segment may be measured by a method of calculating from the molecular weight and the degree of polymerization of N-acyl alkyleneimine unit or by the above-described GPC measuring method, the number average molecular weight measured by the GPC measuring method is adopted in the present embodiment.

Specific examples of polymers of the component (B) include compounds shown in the following general formula (3).

$$\begin{array}{c} \text{CH}_3 - \text{SiO} - \left[\begin{array}{c} \text{CH}_3 \\ | \\ \text{SiO} \\ | \\ \text{CH}_3 \end{array} \right]_r - \left[\begin{array}{c} \text{CH}_3 \\ | \\ \text{SiO} \\ | \\ (\text{CH}_2)_3 \\ | \\ \text{NH}_2 \end{array} \right]_p - \left[\begin{array}{c} \text{CH}_3 \\ | \\ \text{SiO} \\ | \\ (\text{CH}_2)_3 \end{array} \right]_q - \text{Si} - \text{CH}_3 \\ | \qquad \qquad \qquad | \qquad \qquad \qquad | \\ \text{CH}_3 \qquad \qquad \qquad \text{CH}_3 \qquad \qquad \qquad \text{CH}_3 \end{array} \quad (3)$$

Wherein, in the above-described general formula (3), n represents a number of 1 to 5; R⁹ represents hydrogen atom or an alkyl group having 1 to 5 carbon atom(s); m is a degree of polymerization of monomer and represents a number of 1 to 1,000; r represents a number of 10 to 2,000 in average, p represents a number of 0 to 20 in average, and q represents a number of 1 to 20 in average; X⁻ represents a counterion of the quaternary ammonium ion and specifically represents ethyl sulfate ion, methyl sulfate ion, chlorine ion, iodine ion, sulfate ion, para-toluenesulfonate ion or perchlorate ion. In addition to above, a polymerization initiator residue binds to an N-terminal of the constitutional repeating unit of N-acyl alkyleneimine.

Diethyl sulfate, dimethyl sulfate, hydrochloric acid,

hydrogen iodide, sulfuric acid, para-toluenesulfonate, perchloric acid and the like are used for the polymerization initiator, and residues of these compounds bind to the N-terminal of the polymerized product.

5 [0024]

N-propionyl polyethyleneimine-methyl polysiloxane copolymer (POLYSILICONE-9) is preferable for the polymer of the component (B). For example, a compound described in Japanese Patent Laid-Open No. 2009-256,367 may be used as POLYSILICONE-9.

10 [0025]

The content of the component (B) in the skin cosmetic composition in the present embodiment is, for example, equal to or higher than 0.1 % by mass in all components of the skin cosmetic composition except the component (E), in view of providing an improved persistence of the smooth and dry feel and in view of providing the improved persistence of the ultraviolet protective effect of the cosmetic composition, and is preferably equal to or higher than 0.3 % by mass, and is more preferably equal to or higher than 0.5 % by mass, and is further preferably equal to or higher than 0.8 % by mass. On the other hand, in view of suppressing the stickiness of the cosmetic composition to obtain the smooth and dry feel, and in view of reducing a heavier feel of the cosmetic composition during an application thereof and of stably obtaining a preservation stability of the cosmetic composition, the content of the component (B) in the skin cosmetic composition is, for example, equal to or lower than 3 % by mass in all components of the skin cosmetic composition except the

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component (E), and is preferably equal to or lower than 2.5 % by mass, and is more preferably equal to or lower than 1.5 % by mass.

[0026]

(Component (C))

5 The component (C) is an alcohol having carbon atom(s) of equal to or higher than 1 and equal to or lower than 4.

More specifically, the component (C) contains one, two or more selected from the group consisting of methanol, ethanol, propanol and butanol, and is preferably ethanol in view of
10 providing an improved solubility and a dispersibility of the component (B) and in view of achieving an improved handling ability when it is blended in the cosmetic composition.

[0027]

15 The content of the component (C) in the skin cosmetic composition is equal to or higher than 40 % by mass in all components except the component (E) in view of suppressing the stickiness, and is preferably equal to or higher than 60 % by mass.

On the other hand, in view of improving the smooth and dry feel and persistence thereof, the content of the component (C) in
20 the skin cosmetic composition is equal to or lower than 95 % by mass in all components except the component (E), and is preferably equal to or lower than 90 % by mass.

In addition, in a stock solution constituted of all components of the cosmetic composition except the component (E),
25 the content of the component (C) may be determined as the remaining portion of the stock solution except the components other than the component (C).

[0028]

(Powders)

The skin cosmetic composition in the present embodiment contains the components (D1) and (D2) as powder components.

5 The component (D1) is a powder having number average particle size of equal to or larger than 1 μm and equal to or smaller than 10 μm . The component (D2) is a powder having number average particle size of larger than 10 μm and equal to or smaller than 25 μm .

10 [0029]

Here, in the present specification, the average particle diameter is the number average particle diameter measured by the light scattering method. In addition to above, the number average particle diameter means a value obtained by carrying out
15 arithmetic mean of the particle sizes of the respective particles.

[0030]

The powder of the components (D1) and (D2) means a powder of substantially ball-shape, and may be spheroid powder, or spherical powder having uneven surfaces or the like, and is not needed to
20 have completely spherical shape.

The shape of the component (D1) may be the same as, or different from, that of the component (D2).

[0031]

Materials for the components (D1) and (D2) are not limited
25 as long as these are commonly employed for the cosmetic composition, and specific examples of the components (D1) and (D2) include: a polyamide powder, a nylon powder, a polyester powder, a

polyethylene powder, a polypropylene powder, a polystyrene powder, a benzoguanamine powder, a polymethyl benzoguanamine powder, a polymethyl methacrylate powder, a polyurethane powder, a vinyl resin, a fluorocarbon resin, an acrylic resin, a melamine resin; a
5 silicone powder including silicone elastomer powder having bridged dimethyl silicone or polymethyl silsesquioxane powder; and a cross-linked type or a non-cross-linked type organic spherical powder, which is typically a powder of one, two or more polymer(s) or copolymer(s) selected from poly(meth)acrylic acid, sodium
10 poly(meth)acrylate, poly(meth)acrylate ester and alkylene glycol poly(meth)acrylate, such as butyl acrylate-vinyl acetate copolymer, styrene-acrylic acid copolymer, divinylbenzene-styrene copolymer, (lauryl methacrylate/ethylene dimethacrylate glycol) copolymer and the like.

15 The material of the component (D1) may be the same as, or different from, that of the component (D2).

 The constitutions of the components (D1) and (D2) will be more specifically described below.

[0032]

20 The number average particle diameter of the component (D1) is equal to or larger than 1 μm , in terms of exhibiting enhanced smooth and dry touch at the time of applying the cosmetic composition, or more specifically in view of providing the improved smooth and dry feel, and is preferably equal to or larger
25 than 2 μm , and is more preferably equal to or larger than 3 μm . In addition, in view of the above-described aspects, the number average particle size of the component (D1) is equal to or smaller

than 10 μm , and is preferably equal to or smaller than 9 μm , and is more preferably equal to or smaller than 8 μm .

[0033]

In view of suppressing the stickiness, in view of improving the smooth and dry feel and persistence thereof, and in view of providing improved redispersibility of the powder, the component (D1) is preferably a nylon powder, an ethylene powder, a silicone powder, a polymethyl methacrylate powder, and a powder of one, two or more of polymer(s) or copolymer(s) selected from acrylic acid, methacrylic acid, alkyl acrylate, alkyl methacrylate, alkylene glycol acrylate and alkylene glycol methacrylate, and the nylon powder, the silicone powder, the polymethyl methacrylate powder, and the powder of one, two or more of polymer(s) or copolymer(s) selected from alkyl acrylate and alkyl methacrylate are more preferable, and the silicone powder is further preferable.

[0034]

Available materials for the component (D1) may more specifically include the commercially available products such as: the silicone powders such as KMP-599 (3 μm), KSP-100 (5 μm), KSP-105 (2 μm), KSP-300 (5 μm), and X-52-1621 (5 μm) (the above described are commercially available from Shin-Etsu Chemical); Tospearl 120A (2 μm), Tospearl 145A (4.5 μm) (the above described are commercially available from Momentive Performance Materials Japan); Torayfil E506S (4 μm), Torayfil E508 (4 μm), BY29-129 (4 μm) (the above described are commercially available from Dow Corning Toray Silicone Co., Ltd.);

Ganzpearl SI-045C (4.5 μm), Ganzpearl SIG-070 (7 μm); alkyl methacrylates such as: Ganzpearl GMP-0800 (8 μm); polyacrylic acids such as Ganzpearl GMP-0820 (8 μm) (the above described are commercially available from Aica Kogyo Co., Ltd.);

5 copolymers of alkyl methacrylate and alkylene glycol methacrylate such as Matsumoto Microsphere M-201 (4 μm), Matsumoto Microsphere M-305 (8 μm), Matsumoto Microsphere M312 (5.5 μm) (the above described are commercially available from Matsumoto Yushi Seiyaku); and

10 nylon powders such as: Nylon SP-500 (5 μm) and Nylon SP-10 (10 μm) (the above described are commercially available from Toray).

[0035]

Among these, X-52-1621 (5 μm) (commercially available from Shin-Etsu Chemical), Tospearl 145A (4.5 μm) (commercially
15 available from Momentive Performance Materials Japan) and Ganzpearl SI-045C (4.5 μm) (commercially available from Aica Kogyo Co., Ltd.), which are the silicone powder, are preferable for the component (D1), in terms of providing the smooth and dry touch at the time of the application or more specifically providing further
20 enhanced smooth and dry feel, and in terms of achieving a non-powdery finish.

[0036]

In the next, the component (D2) will be described.

The number average particle diameter of the component (D2)
25 is larger than 10 μm , in view of providing an enhanced spreadability over the skin and in view of providing the improved redispersibility of the powder, and is preferably equal to or

larger than 11 μm , and is more preferably equal to or larger than 13 μm , and is further preferably equal to or larger than 15 μm .

On the other hand, in view of the above-described aspects, the number average particle diameter of the component (D2) is equal to or smaller than 25 μm , and is preferably equal to or smaller than 24 μm , and is more preferably equal to or smaller than 23 μm .

[0037]

The particle size ratio ((D1) / (D2)) of the component (D1) to the component (D2) is, for example, equal to or lower than 1/2, in terms of providing the enhanced smooth and dry touch at the time of applying the cosmetic composition over the skin or namely in view of providing the improved smooth and dry feel, and in view of providing enhanced spreadability over the skin, and in view of providing improved redispersibility of the powder, and is

preferably equal to or lower than 1/2.5, and is more preferably equal to or lower than 1/2.8, and is further preferably, equal to or lower than 1/3, and on the other hand, is, for example, equal to or higher than 1/10, and is preferably equal to or higher than 1/8, and is more preferably equal to or higher than 1/7, and is further preferably, equal to or higher than 1/6.

[0038]

A nylon powder, an ethylene powder, a silicone powder, a polymethyl methacrylate powder, and a powder of one, two or more of polymer(s) or copolymer(s) selected from acrylic acid,

methacrylic acid, alkyl acrylate, alkyl methacrylate, alkylene glycol acrylate and alkylene glycol methacrylate are preferable for the component (D2), and a powder of copolymer of at least one

selected from alkyl acrylate and alkyl methacrylate and at least one selected from alkylene glycol acrylate and alkylene glycol methacrylate is more preferable, and a powder of copolymer of alkyl methacrylate and alkylene glycol methacrylate is more preferable.

[0039]

Available materials for the component (D2) may more specifically include the commercially available products such as: the silicone powders such as KMP-601 (12 μm), KMP-598 (13 μm),

KSP-101 (12 μm) (the above described are commercially available from Shin-Etsu Chemical); alkyl methacrylates such as Ganzpearl GM -2000 (20 μm), Ganzpearl GMX-2001 (20 μm); divinylbenzene-styrene copolymer such as Ganzpearl GS-1105 (11 μm) (the above described are commercially available from Aica Kogyo Co., Ltd.);

copolymer of alkyl methacrylate and alkylene glycol methacrylate such as Matsumoto Microsphere M-503 (20 μm) (the above described is commercially available from Matsumoto Yushi Seiyaku Corporation);

ethylene powders such as Flow Beads CL-2080 (11 μm), Flow Beads CL-3080 (13 μm) (the above described are commercially available from Sumitomo Seika Chemicals Co., Ltd); and

nylon powders such as Nylon TR-1 (13 μm), nylon TR-2 (20 μm) (the above described are commercially available from Toray Corporation).

[0040]

Among these, Matsumoto Microsphere M-503 (20 μm) (commercially available from Matsumoto Yushi Seiyaku), which is

copolymer of alkyl methacrylate and alkylene glycol methacrylate, and Ganzpearl GMX-2001 (20 μm), and Ganzpearl GM-2000 (20 μm) (commercially available from Aica Kogyo Co., Ltd.), are preferable for the component (D2), in view of providing the improved
5 redispersibility of the powder, and in terms of exhibiting a good spreading during the application of the cosmetic composition.

[0041]

And on the other hand, in view of improving the smooth and dry feel and the persistence thereof and in view of providing the
10 improved redispersibility of the powder, the component (D1) or the component (D2) may be the nylon powder, the ethylene powder, the silicone powder, the polymethyl methacrylate powder, or the powder of one, two or more of polymer(s) or copolymer(s) selected from acrylic acid, methacrylic acid, alkyl acrylate, alkyl methacrylate,
15 alkylene glycol acrylate and alkylene glycol methacrylate.

[0042]

Also, as the specific examples of combinations of the components (D1) and (D2), a preferable combination is a combination of the component (D1), which is one, two or more
20 selected from the group consisting of the silicone powder, the nylon powder and the powder of one, two or more of polymer(s) or copolymer(s) selected from acrylic acid, methacrylic acid, alkyl acrylate, alkyl methacrylate, alkylene glycol acrylate and alkylene glycol methacrylate, and the component (D2), which is one,
25 two or more selected from the group consisting of the powder of one, two or more of polymer(s) or copolymer(s) selected from acrylic acid, methacrylic acid, alkyl acrylate, alkyl methacrylate,

alkylene glycol acrylate and alkylene glycol methacrylate, the ethylene powder and the nylon powder.

[0043]

The mass ratio of the component (D1) to the component (D2),
5 or more specifically the mass ratio ((D1) / (D2)) of the component (D1) to the component (D2) is, for example, equal to or lower than 20/1, in view of providing the improved redispersibility of the powder in the cosmetic composition and/or in view of preferably adhering onto the skin to provide the improved smooth and dry
10 touch (smooth and dry feel) at the time of the application, and is preferably equal to or lower than 15/1, and is more preferably equal to or lower than 10/1, and is further preferably equal to or lower than 8/1, and on the other hand is, for example, equal to or higher than 1/2, and is preferably equal to or higher than 1/1,
15 and is more preferably equal to or higher than 2/1.

[0044]

Also, the contents of the components (D1) and (D2) in the skin cosmetic composition according to the present embodiment is preferably, for example, equal to or higher than 0.5 % by mass,
20 presented as the total amount of the components (D1) and (D2) assuming that all components except the component (E), or more specifically the stock solution, is 100%, in view of suppressing the stickiness of the cosmetic composition at the time of application to provide smooth and dry touch (smooth and dry feel)
25 to the skin, and is more preferably equal to or higher than 1 % by mass, and is further preferably equal to or higher than 1.5 % by mass.

On the other hand, in view of maintaining the enhanced redispersibility of the powder and in view of suppressing a clogging of the skin cosmetic composition at the time of spraying the cosmetic composition, the contents of the components (D1) and (D2) in the skin cosmetic composition is, for example, equal to or lower than 10 % by mass, presented as the total amount of the components (D1) and (D2) assuming that all components except the component (E), or more specifically the stock solution, is 100%, and is preferably equal to or lower than 6 % by mass, and is more preferably equal to or lower than 5 % by mass, and is further more preferably equal to or lower than 4 % by mass.

In the present embodiment, the clogging of the skin cosmetic composition at the time of spraying the cosmetic composition means that a discharge of the cosmetic composition is restrained at any part of the container before discharging from a container to an outside of the container through a discharge outlet, when the cosmetic composition stored in the container is applied over the skin.

[0045]

Also, the ratio $((B) / [(D1) + (D2)])$ of the component (B) over the total amount of the components (D1) and (D2) is, for example, equal to or higher than 0.05 presented by the mass ratio, in view of further improving the persistence of the ultraviolet protective effect and the persistence of the smooth and dry feel by preferably adhering over the skin, and is preferably equal to or higher than 0.1, and is more preferably equal to or higher than 0.2, and is further preferably equal to or higher than 0.25, and

on the other hand is, for example, equal to or lower than 1, and is preferably equal to or lower than 0.8, and is more preferably equal to or lower than 0.75.

[0046]

5 (Component (E))

Component (E) is a propellant.

Specific examples of the propellant of the component (E) includes one, two or more selected from liquefied natural gas (LPG), dimethyl ether (DME), carbonic acid gas, nitrogen gas, and
10 a mixture thereof, and the like. Also, alternatives for chlorofluorocarbon such as HFC-152a may be used.

Boiling point of the propellant of the component (E) is, for example, equal to or higher than -50 degrees C, in view of providing an enhanced cool feel, and is preferably equal to or
15 higher than -40 degrees C, and on the other hand is, for example, equal to or lower than 0 degree C, and is preferably equal to or lower than -20 degrees C. A more preferable example of the component (E) includes LPG.

[0047]

20 The content of the propellant of the component (E) in the skin cosmetic composition is, for example, equal to or higher than 10/90 as the stock solution/propellant, which is presented by the mass ratio of the stock solution to the propellant, in which the stock solution is composed of the components of the skin cosmetic
25 composition except the component (E), namely the components (A) to (C), (D1) and (D2) and any arbitrary component, in view of obtaining an improved cool feel and in view of improving the

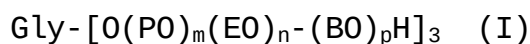
ultraviolet protective effect and the feel of use by preferably attaching the cosmetic composition over the skin, and is preferably equal to or higher than 20/80, and is more preferably equal to or higher than 30/70, and on the other hand is, for example, equal to or lower than 70/30, and is preferably equal to or lower than 60/40, and is more preferably equal to or lower than 50/50.

[0048]

Also, it is preferable to control the amount or the ratio of the component (E), so that a pressure in a pressure vessel filled with the skin cosmetic composition is, for example, equal to or higher than 0.15 MPa and equal to or lower than 0.40 MPa at a temperature of 25 degrees C and is preferably equal to or higher than 0.18 MPa and equal to or lower than 0.35 MPa.

[0049]

Also, in the present embodiment, the skin cosmetic composition may further contain a component (F) as described below. (F) alkylene oxide derivative represented by the following general formula (I):



wherein, in the above-described general formula (I), Gly is a residue of eliminating hydroxyl group from glycerin, PO is an oxypropylene group, and EO is oxyethylene group. m and n are average molar numbers of added EO and PO, respectively, and have a value of from 1 to 50, and the mass ratio (PO/EO) of PO to EO is from 1/5 to 5/1. BO is oxyalkylene group having 4 carbon atoms. p is an average molar number of added BO and has a value of from

0.5 to 5.

[0050]

More specifically, a material described in Japanese Patent Laid-Open No. 2006-225,324 may be used for the component (F).

5 More specifically, the component (F) is obtainable by adding propylene oxide (PO) and ethylene oxide (EO) to glycerin at ratios of 3 to 150 molar equivalent with respect to glycerin, respectively, and then adding alkylene oxide having 4 carbon atoms to glycerin at a ratio of 1.5 to 15 molar equivalent. More
10 specifically, an addition product with PO and EO is once synthesized, and then alkylene oxide having 4 carbon atoms is added in a block-form to obtain the component (F).

[0051]

The average molar numbers of added propylene oxide (PO) and
15 ethylene oxide (EO) are preferably equal to or higher than 1, respectively, in view of suppressing the stickiness of the cosmetic composition and in view of providing the improved spreadability of the cosmetic composition. On the other hand, in view of the similar aspect, the average molar numbers of added PO
20 and EO are preferably equal to or lower than 50, respectively.

[0052]

The average molar number of added alkylene oxide (BO) having 4 carbon atoms is preferably equal to or higher than 0.5, in view of suppressing the stickiness. Also, in view of providing the
25 improved spreadability of the cosmetic composition and in view of providing the improved adhesion of the cosmetic composition, the average molar number of added BO is preferably equal to or lower

than 5.

[0053]

Typical alkylene oxide having 4 carbon atoms includes 1,2-butylene oxide, 2,3-butylene oxide, tetramethylene oxide

5 (tetrahydrofuran) and the like. Among these, in terms of an easy availability and an easy reaction control and the like, 1,2-butylene oxide is preferable.

[0054]

When these alkylene oxides are added to glycerin, the
10 addition reaction is conducted by employing an alkali catalyst, a phase transfer catalyst, a Lewis acid catalyst or the like. Generally, it is preferable to employ the alkali catalyst such as potassium hydroxide and the like.

In view of suppressing the stickiness of the cosmetic
15 composition and in view of providing the improved spreadability of the cosmetic composition, alkylene oxide derivative of the component (F) is preferably polyoxybutylene polyoxyethylene polyoxypropylene glycerin (INCI name: PEG/PPG/polybutylene glycol-8/5/3 glycerin), which is commercially available from Nippon Oil &
20 Fats Corporation as WILBRIDE S-753.

[0055]

The content of the component (F) in the skin cosmetic composition is, for example, equal to or higher than 0.1 % by mass in all components except the component (E), in view of suppressing
25 the stickiness, and is preferably equal to or higher than 0.5 % by mass, and is more preferably equal to or higher than 1 % by mass, and is further preferably equal to or higher than 1.2 % by mass.

On the other hand, in view of suppressing the stickiness and in view of obtaining the smooth and dry feel of use (smooth and dry feel), the content of the component (F) in the skin cosmetic composition is, for example, equal to or lower than 3 % by mass in all components except the component (E), and is preferably equal to or lower than 2.5 % by mass.

[0056]

Also, the mass ratio ((A) / (F)) of the component (A) to the component (F) in the skin cosmetic composition according to the present embodiment is preferably equal to or lower than 25/1, in view of suppressing the stickiness and in view of obtaining the smooth and dry feel of use (smooth and dry feel), and is more preferably equal to or lower than 15/1, and is further preferably equal to or lower than 10/1, and on the other hand is preferably equal to or higher than 3/1, and is more preferably equal to or higher than 4/1, and is further preferably equal to or higher than 5/1.

[0057]

In addition, any of components except the components stated above, such as for example, surfactants, oily ingredients, flavors, moisturizers, beauty components, medicinal properties, thickeners, sterilizers, pH adjusters, antioxidants, antiseptics and other components employed for ordinary cosmetic compositions may be incorporated in the skin cosmetic composition of the present embodiment.

[0058]

Further, in the skin cosmetic composition of the present

embodiment, the content of water is preferably equal to or lower than 1 % by mass in all formulations except the component (E), in view of obtaining a uniform composition and having better appearance, and is more preferably equal to or lower than 0.5 % by mass, and
5 is further preferably equal to or lower than 0.1 % by mass, and is furthermore preferably equal to or lower than 0.05 % by mass, and is yet more preferably equal to or lower than 0.01 % by mass, and is yet furthermore preferably substantially zero.

On the other hand, in the skin cosmetic composition of the
10 present embodiment, the content of water is preferably equal to or higher than 1 % by mass in all formulations except the component (E), in view of providing a further improved ultraviolet absorptivity and in view of providing a freshness when it is used, and is more preferably equal to or higher than 3 % by mass. And
15 on the other hand, in view of suppressing the stickiness to provide a refreshing feel of use, the content of water in the skin cosmetic composition is preferably equal to or lower than 8 % by mass in all formulations except the component (E), and is more preferably equal to or lower than 7 % by mass.

20 [0059]

In the skin cosmetic composition of the present embodiment, the content of the thickener is preferably equal to or lower than 3 % by mass in all formulations except the component (E) in view of achieving a better spraying state, and is more preferably equal
25 to or lower than 2 % by mass, and is further preferably equal to or lower than 1 % by mass, and is furthermore preferably equal to or lower than 0.05 % by mass, and is yet more preferably equal to

or lower than 0.01% by mass, and is yet furthermore preferably substantially zero. The better spraying state is ensured to allow suppressing an application irregularity over the skin during an application and an irregularity in an adhesion of the cosmetic composition. Thus, the feel of use of the cosmetic composition in terms of the suppression of the stickiness and the provision of the smooth and dry feel, and the persistence of the ultraviolet protective effect, can be improved.

[0060]

It is also an effective method to contain a surfactant in the skin cosmetic composition of the present embodiment, in view of enhancing the dispersibility of the ultraviolet protective agent and the powder and of further improving the redispersibility of the powder. In view of the aforementioned aspects, the content of the surfactant is preferably equal to or higher than 0.001 % by mass in all formulations except the component (E), and is more preferably equal to or higher than 0.005 % by mass, and is further preferably equal to or higher than 0.007 % by mass, and on the other hand is preferably equal to or lower than 0.5 % by mass, and is more preferably equal to or lower than 0.3 % by mass, and is further preferably equal to or lower than 0.1 % by mass.

[0061]

In the next, a preparation process for the skin cosmetic composition in the present embodiment will be described.

The skin cosmetic composition in the present embodiment is produced according to a process including, for example: preparing the stock solution by mixing the components except the component

(E), the propellant, to cause dissolution or dispersion; and filling the stock solution obtained in the above-described step with the component (E), the propellant, in a pressure vessel.

The pressure vessel, which is employed in an ordinary aerosol production, may be used.

[0062]

Since the components (A) to (C), (D1), (D2) and (E) are used in combination, and the content of the component (C) and the mass ratio of the component (D1) to the component (D2) are within the specific ranges in the present embodiment, the cosmetic composition, which exhibits a better balance between the preferable feel of use and the persistence of the ultraviolet protective effect and also exhibits an enhanced redispersibility of the powder in the cosmetic composition, can be obtained. More specifically, the skin cosmetic composition, which exhibits suppressed stickiness and thus smooth and dry feel, can be obtained.

[0063]

More specifically, the components (B) and (C) are employed in combination to allow improving a balance between the persistence of the ultraviolet protective effect and the suppression effect for the stickiness of the cosmetic composition.

Also, multiple types of powder having different sizes are employed in a specific combination for the components (D1) and (D2) to allow suppressing the application irregularity over the skin during the application and the irregularity in the adhesion of the cosmetic composition. Thus, the feel of use of the

cosmetic composition in terms of the suppression of the stickiness and the provision of the smooth and dry feel, and the persistence of the ultraviolet protective effect, can be improved. Also, the redispersibility of the powder in the cosmetic composition can be improved.

Also, the skin cosmetic composition of the present embodiment may be preferably employed as, for example, an ultraviolet protective cosmetic composition.

The skin cosmetic composition of the present embodiment can be adopted by being applied over the skin, preferably over any of the face, the body, the hands and the feet. In addition, the skin cosmetic composition of the present embodiment can also be used for the scalp or the hair.

In addition, the skin cosmetic composition of the present embodiment can be applied to the skin to block ultraviolet rays, while the stickiness can be suppressed, and the smooth and dry feel can be further provided.

[0064]

While preferable embodiments of the present invention have been described above, it is intended to present these embodiments for the purpose of illustrations of the present invention only, and various modifications other than that described above are also available.

[0065]

Preferable aspects of the present invention will be further disclosed below, in relation to the above-described embodiments.

[0066]

<1> A skin cosmetic composition containing following components (A), (B), (C), (D1), (D2) and (E):

(A) an ultraviolet protective agent;

(B) a polymer containing constitutional units of a hydrophilic segment having an N-acyl alkyleneimine as its repeating unit and an organo polysiloxane segment;

(C) an alcohol having carbon atom(s) of equal to or larger than 1 and equal to or smaller than 4;

(D1) a powder having number average particle size of equal to or larger than 1 μm and equal to or smaller than 10 μm ;

(D2) a powder having number average particle size of larger than 10 μm and equal to or smaller than 25 μm ; and

(E) a propellant

wherein a content of the component (C) in all components of the skin cosmetic composition except the component (E) is equal to or higher than 40 % by mass and equal to or lower than 95 % by mass, and

wherein a mass ratio of the component (D1) to the component (D2) in the skin cosmetic composition is presented as:

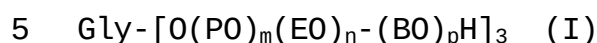
(Component (D1)/Component (D2)) = 1/2 to 20/1.

[0067]

<2> The skin cosmetic composition according to the aforementioned <1>, wherein a total amount of the component (D1) and the component (D2) in all components of the skin cosmetic composition except the component (E) is equal to or higher than 0.5 % by mass and equal to or lower than 10 % by mass.

<3> The skin cosmetic composition according to the

aforementioned <1> or <2>, further containing (F) an alkylene oxide derivative represented by the following general formula (I) at equal to or higher than 0.1 % by mass and equal to or lower than 3 % by mass:



wherein, in the above-described general formula (I), Gly is a residue of eliminating hydroxyl group from glycerin, P0 is an oxypropylene group, and EO is an oxyethylene group. m and n are average molar numbers of added EO and P0, respectively, and have a value of from 1 to 50, and the mass ratio (P0/EO) of P0 to EO is from 1/5 to 5/1. BO is an oxyalkylene group having 4 carbon atoms. p is an average molar number of added BO and has a value of from 0.5 to 5.

<4> The skin cosmetic composition according to any one of the
 15 aforementioned <1> to <3>, wherein the component (A) is one, two or more selected from the group consisting of an ultraviolet scattering agent and an organic ultraviolet absorbing agent, and is preferably one, two or more selected from the group consisting of an ultraviolet scattering agent and an organic ultraviolet
 20 absorbing agent having a number average particle diameter of equal to or larger than 1 nm, preferably equal to or larger than 10 nm, and more preferably equal to or larger than 30 nm, and on the other hand is equal to or smaller than 500 nm, and preferably equal to or smaller than 300 nm, and more preferably equal to or
 25 smaller than 200 nm, and more preferably contains at least one selected from a benzoic acid-based ultraviolet absorbing agent, a benzophenone-based ultraviolet absorbing agent, a cinnamic acid-

based ultraviolet absorbing agent, and a triazine-based ultraviolet absorbing agent, and further preferably contains at least one selected from a benzoic acid-based ultraviolet absorbing agent, a cinnamic acid-based ultraviolet absorbing agent and a triazine-based ultraviolet absorbing agent, and furthermore preferably contains at least two selected from a benzoic acid-based ultraviolet absorbing agent, a cinnamic acid-based ultraviolet absorbing agent and a triazine-based ultraviolet absorbing agent, and yet furthermore preferably employ a combination of 2-ethylhexyl-p-methoxycinnamate and diethylamino hydroxybenzoyl hexyl benzoate.

<5> The skin cosmetic composition according to the aforementioned <4>, wherein ratio of 2-ethylhexyl-p-methoxycinnamate to diethylamino hydroxybenzoyl hexyl benzoate, according to the mass ratio (2-ethylhexyl-p-methoxycinnamate/diethylamino hydroxybenzoyl hexyl benzoate), is for example, equal to or lower than 10/1 and is preferably equal to or lower than 8/1, and is more preferably equal to or lower than 7/1 and on the other hand is for example, equal to or higher than 2/1, and is preferably equal to or higher than 3/1, and is more preferably equal to or higher than 4/1.

<6> The skin cosmetic composition according to any one of the aforementioned <1> to <5>, wherein a content of the component (A) of the skin cosmetic composition is equal to or higher than 0.1 % by mass in all components of the skin cosmetic composition except the component (E), and is preferably equal to or higher than 1 % by mass, and is more preferably equal to or higher than 5 % by

mass, and further preferably equal to or higher than 10 % by mass, and on the other hand is equal to or lower than 30 % by mass, and is preferably equal to or lower than 25 % by mass, and is more preferably equal to or lower than 20 % by mass, and is further
5 preferably equal to or lower than 18 % by mass.

<7> The skin cosmetic composition according to any one of the aforementioned <1> to <6>, wherein, in the component (B), a mass ratio a/b of the organo polysiloxane segment to the hydrophilic segment having the N-acyl alkyleneimine as its repeating unit

10 (organo polysiloxane segments a / hydrophilic segments b having N-acyl alkyleneimine as its repeating unit) is equal to or higher than 45/55, and is preferably a/b = equal to or higher than 65/35, and is more preferably equal to or higher than 85/15, and on the other hand is equal to or lower than 94/6, and is preferably equal
15 to or lower than 92/8, and is more preferably equal to or lower than 90/10.

<8> The skin cosmetic composition according to any one of the aforementioned <1> to <7>, wherein, in the component (B), a weight average molecular weight of the organo polysiloxane segment is
20 equal to or higher than 1×10^4 , and is preferably equal to or higher than 2×10^4 , and is more preferably equal to or higher than 3.5×10^4 , and on the other hand is equal to or lower than 3×10^5 , and is preferably equal to or lower than 2×10^5 , and is more preferably equal to or lower than 1.5×10^5 .

25 <9> The skin cosmetic composition according to any one of the aforementioned <1> to <8>, wherein a number average molecular weight of the poly(N-acyl alkyleneimine) segment in the component

(B) is equal to or higher than 5×10^2 , and is preferably equal to or higher than 7×10^2 , and is more preferably equal to or higher than 8×10^2 , and on the other hand is equal to or lower than 4×10^3 , and is preferably equal to or lower than 3.5×10^3 , and is more preferably equal to or lower than 3×10^3 .

<10> The skin cosmetic composition according to any one of the aforementioned <1> to <9>, containing N-propionyl polyethyleneimine methyl polysiloxane copolymer (POLYSILICONE-9) as the polymer of the component (B).

<11> The skin cosmetic composition according to any one of the aforementioned <1> to <10>, wherein a content of the component (B) in the skin cosmetic composition is equal to or higher than 0.1% by mass in all components of the skin cosmetic composition except the component (E), and is preferably equal to or higher than 0.3 % by mass, and is more preferably equal to or higher than 0.5 % by mass, and is more preferably equal to or higher than 0.8 % by mass, and on the other hand is equal to or lower than 3 % by mass, and is preferably equal to or lower than 2.5 % by mass, and is more preferably equal to or lower than 1.5 % by mass.

<12> The skin cosmetic composition according to any one of the aforementioned <1> to <11>, wherein the component (C) is one, two or more selected from the group consisting of methanol, ethanol, propanol and butanol, and ethanol is preferable.

<13> The skin cosmetic composition according to any one of the aforementioned <1> to <12>, wherein a content of the component (C) in the skin cosmetic composition is equal to or higher than 40 % by mass in all components except the component (E), and is

preferably equal to or higher than 60 % by mass, and on the other hand is equal to or lower than 95 % by mass, and is preferably equal to or lower than 90 % by mass, and may be a remaining portion of a stock solution except the components other than the component (C), the stock solution being constituted of all components of the cosmetic composition except the component (E).

<14> The skin cosmetic composition according to any one of the aforementioned <1> to <13>, wherein materials of the components (D1) and (D2) are: a polyamide powder, a nylon powder, a polyester powder, a polyethylene powder, a polypropylene powder, a polystyrene powder, a benzoguanamine powder, a polymethyl benzoguanamine powder, a polymethyl methacrylate powder, a polyurethane powder, a vinyl resin, a fluorocarbon resin, an acrylic resin, a melamine resin, a silicone powder including a silicone elastomer powder with a bridged dimethyl silicone or a polymethyl silsesquioxane powder; and a cross-linked type or non-cross-linked type organic spherical powder, which is typically a powder of one, two or more polymer(s) or copolymer(s) selected from poly(meth)acrylic acid, sodium poly(meth)acrylate, poly(meth)acrylate ester and alkylene glycol poly(meth)acrylate, such as butyl acrylate-vinyl acetate copolymer, styrene-acrylic acid copolymer, divinylbenzene-styrene copolymer, (lauryl methacrylate/ethylene dimethacrylate glycol) copolymer and the like.

<15> The skin cosmetic composition according to any one of the aforementioned <1> to <14>, wherein a number average particle diameter of the component (D1) is equal to or larger than 1 μm ,

and is preferably equal to or larger than 2 μm , and is more preferably equal to or larger than 3 μm , and on the other hand is equal to or smaller than 10 μm , and is preferably equal to or smaller than 9 μm , and is more preferably equal to or smaller than 8 μm .

<16> The skin cosmetic composition according to any one of the aforementioned <1> to <15>, wherein a particle size ratio ((D1) / (D2)) of the component (D1) to the component (D2) is equal to or lower than 1/2, and is preferably equal to or lower than 1/2.5, and is more preferably equal to or lower than 1/2.8, and is further preferably equal to or lower than 1/3, and on the other hand is, for example, equal to or higher than 1/10, and is preferably equal to or higher than 1/8, and is more preferably equal to or higher than 1/7, and is further preferably equal to or higher than 1/6.

<17> The skin cosmetic composition according to any one of the aforementioned <1> to <16>, wherein the component (D1) is a nylon powder, a silicone powder, a polymethyl methacrylate powder, or a powder of one, two or more of polymer(s) or copolymer(s) selected from acrylic acid, methacrylic acid, alkyl acrylate, alkyl methacrylate, alkylene glycol acrylate and alkylene glycol methacrylate, and is more preferably the nylon powder, the silicone powder, the polymethyl methacrylate powder, or the powder of one, two or more of polymer(s) or copolymer(s) selected from alkyl acrylate and alkyl methacrylate, and is further preferably the silicone powder.

<18> The skin cosmetic composition according to any one of the

aforementioned <1> to <17>, wherein a number average particle diameter of the component (D2) is larger than 10 μm , and is preferably equal to or larger than 11 μm , and is more preferably equal to or larger than 13 μm , and is further preferably equal to or larger than 15 μm , and on the other hand is equal to or smaller than 25 μm , and is preferably equal to or smaller than 24 μm , and is more preferably equal to or smaller than 23 μm .

<19> The skin cosmetic composition according to any one of the aforementioned <1> to <18>, wherein the component (D2) is a nylon powder, an ethylene powder, a silicone powder, a polymethyl methacrylate powder, or a powder of one, two or more of polymer(s) or copolymer(s) selected from acrylic acid, methacrylic acid, alkyl acrylate, alkyl methacrylate, alkylene glycol acrylate and alkylene glycol methacrylate, and is more preferably a powder of copolymer of at least one selected from alkyl acrylate and alkyl methacrylate and at least one selected from alkylene glycol acrylate and alkylene glycol methacrylate, and is further preferably a powder of copolymer of alkyl methacrylate and alkylene glycol methacrylate.

<20> The skin cosmetic composition according to any one of the aforementioned <1> to <19>, wherein a ratio ((D1) / (D2)) of the component (D1) to the component (D2) is equal to or lower than 20/1 presented by the mass ratio, and is preferably equal to or lower than 15/1, and is more preferably equal to or lower than 10/1, and is further preferably equal to or lower than 8/1, and on the other hand is equal to or higher than 1/2, and is preferably equal to or higher than 1/1, and is more preferably equal to or

higher than 2/1.

<21> The skin cosmetic composition according to any one of the
aforementioned <1> to <20>, wherein contents of the components
(D1) and (D2) in the skin cosmetic composition is equal to or
5 higher than 0.5 % by mass presented as the total amount of the
components (D1) and (D2), and is preferably equal to or higher
than 1 % by mass, and is more preferably equal to or higher than
1.5 % by mass, and on the other hand is equal to or lower than
10 % by mass, and is preferably equal to or lower than 6 % by mass,
10 and is more preferably equal to or lower than 5 % by mass, and is
further preferably equal to or lower than 4 % by mass.

<22> The skin cosmetic composition according to any one of the
aforementioned <1> to <21>, wherein a ratio $((B) / [(D1) + (D2)])$
of the component (B) to the total amount of the components (D1)
15 and (D2) is equal to or higher than 0.05 presented by the mass
ratio, and is preferably equal to or higher than 0.1, and is more
preferably equal to or higher than 0.2, and is further preferably
equal to or higher than 0.25, and on the other hand is equal to or
lower than 1, and is preferably equal to or lower than 0.8, and is
20 more preferably equal to or lower than 0.75.

<23> The skin cosmetic composition according to any one of the
aforementioned <1> to <22>, wherein the component (E) is one, two
or more selected from liquefied natural gas (LPG), dimethyl ether
(DME), carbonic acid gas, nitrogen gas, alternatives for
25 chlorofluorocarbon, mixture thereof and the like, and is
preferably LPG.

<24> The skin cosmetic composition according to any one of the

aforementioned <1> to <23>, wherein boiling point of the component (E) is equal to or higher than -50 degrees C, and is preferably equal to or higher than -40 degrees C, and on the other hand is equal to or lower than 0 degree C, and is preferably equal to or lower than -20 degrees C.

<25> The skin cosmetic composition according to any one of the aforementioned <1> to <24>, wherein a content of the component (E) in the skin cosmetic composition is equal to or higher than 10/90 as a stock solution/propellant, which is presented by the mass ratio of the stock solution to the propellant, in which the stock solution is composed of the components of the skin cosmetic composition except the component (E), namely the components (A) to (C), (D1) and (D2) and any arbitrary component, and is preferably equal to or higher than 20/80, and is more preferably equal to or higher than 30/70, and on the other hand is equal to or lower than 70/30, and is preferably equal to or lower than 60/40, and is more preferably equal to or lower than 50/50.

<26> The skin cosmetic composition according to any one of the aforementioned <1> to <25>, further containing (F) alkylene oxide derivative represented by the above-described general formula (I), wherein the alkylene oxide derivative of the component (F) is polyoxybutylene polyoxyethylene polyoxypropylene glycerin (INCI name: PEG/PPG/polybutylene glycol-8/5/3 glycerin).

<27> The skin cosmetic composition according to any one of the aforementioned <1> to <26>, wherein a content of water in the skin cosmetic composition is equal to or lower than 1% by mass in all components except the component (E), and is preferably equal to or

lower than 0.5% by mass, and is more preferably equal to or lower than 0.1% by mass, and is further preferably equal to or lower than 0.05% by mass, and is furthermore preferably equal to or lower than 0.01% by mass, and is yet furthermore preferably substantially equal to or lower than 0 % by mass.

<28> The skin cosmetic composition according to any one of the aforementioned <1> to <26>, wherein a content of water in the skin cosmetic composition is preferably equal to or higher than 1% by mass by mass in all components except the component (E), and is more preferably equal to or higher than 3% by mass, and on the other hand is preferably equal to or lower than 8% by mass, and is more preferably equal to or lower than 7% by mass.

<29> The skin cosmetic composition according to any one of the aforementioned <1> to <28>, further containing (F) alkylene oxide derivative represented by the above-described general formula (I), wherein a content of the component (F) in the skin cosmetic composition is equal to or higher than 0.1% by mass in all components except the component (E), and is preferably equal to or higher than 0.5% by mass, and is more preferably equal to or higher than 1% by mass, and is further preferably equal to or higher than 1.2% by mass, and on the other hand is equal to or lower than 3% by mass, and is preferably equal to or lower than 2.5% by mass.

<30> The skin cosmetic composition according to any one of the aforementioned <1> to <29>, further containing (F) alkylene oxide derivative represented by the above-described general formula (I), wherein, the mass ratio ((A) / (F)) of the component (A) to the

component (F) in the skin cosmetic composition is preferably equal to or lower than 25/1, and is more preferably equal to or lower than 15/1, and is further preferably equal to or lower than 10/1, and on the other hand is preferably equal to or higher than 3/1, and is more preferably equal to or higher than 4/1, and is further preferably equal to or higher than 5/1.

<31> The skin cosmetic composition according to any one of the aforementioned <1> to <30>, wherein a content of a thickener in the skin cosmetic composition is equal to or lower than 3 % by mass in all components except the component (E), and is preferably equal to or lower than 2 % by mass, and is more preferably equal to or lower than 1 % by mass, and is further preferably equal to or lower than 0.05 % by mass, and is furthermore preferably equal to or lower than 0.01% by mass, and is yet more preferably substantially zero.

<32> The skin cosmetic composition according to any one of the aforementioned <1> to <31>, wherein a content of a surfactant is equal to or higher than 0.001 % by mass in all components except the component (E), and is preferably equal to or higher than 0.005 % by mass, and is more preferably equal to or higher than 0.007 % by mass, and on the other hand is equal to or lower than 0.5 % by mass, and is preferably equal to or lower than 0.3 % by mass, and is more preferably equal to or lower than 0.1 % by mass.

<33> A process for preparing the skin cosmetic composition according to any one of the aforementioned <1> to <32>, including: preparing a stock solution by mixing the components except the component (E) to cause dissolution or dispersion; and filling the

stock solution obtained in the above-described step with the component (E), the propellant, in a pressure vessel.

<34> A method for using a skin cosmetic composition, including applying the skin cosmetic composition according to any one of the
5 aforementioned <1> to <32> to a skin, and preferably including applying thereof to any of scalp, face, body, and hands and feet.

<35> A method for protecting against an ultraviolet ray, including applying the skin cosmetic composition according to any one of the aforementioned <1> to <32> to a skin.

10 <36> A method for suppressing a stickiness, including applying the skin cosmetic composition according to any one of the aforementioned <1> to <32> to a skin.

<37> A method for creating a smooth and dry feel, or a method for improving a persistence of the smooth and dry feel, including
15 applying the skin cosmetic composition according to any one of the aforementioned <1> to <32> to a skin.

<38> A use of the skin cosmetic composition according to any one of the aforementioned <1> to <32> for protecting against ultraviolet ray, suppressing a stickiness, or providing a smooth
20 and dry feel.

<39> A use of the skin cosmetic composition according to any one of the aforementioned <1> to <32> for a production of an ultraviolet protective cosmetic composition, a stickiness-suppressing cosmetic composition, or a smooth and dry feel-
25 providing cosmetic composition.

EXAMPLES

[0068]

Embodiments of the present invention will be more specifically described in reference to the following Examples. It should be understood that the Examples are presented only for
5 explanations, and it is not intended to present them for the purpose of limiting the scope of the present invention.

[0069]

Production Example 1 (Production 1 of N-propionyl polyethyleneimine methyl polysiloxane copolymer)

10 Poly(N-propionyl ethyleneimine) having number average molecular weight 2,700 was obtained from 0.8 g (0.005 mol) of diethyl sulfate and 12.8 g (0.14 mol) of 2-ethyl-2-oxazoline, and 29 g of dehydrated ethyl acetate. Further, 100 g of a side-chain primary aminopropyl-modified polydimethyl siloxane (weight average
15 molecular weight: 100,000, amine equivalent: 20,000) was employed to obtain N-propionyl ethyleneimine-dimethylsiloxane copolymer, as a pale yellow rubber-like solid (111 g, yield 98%). The content of the organo polysiloxane segment in the final product was 88% by mass ($a/b = 88/12$), and the weight average molecular weight (M_{wt})
20 of the organo polysiloxane was 114,000. It was found from the result of neutralization titration with hydrochloric acid employing methanol as a solvent that no residual amino group was present.

[0070]

25 Production Example 2 (Production 2 of N-propionyl polyethyleneimine methyl polysiloxane copolymer)

According to a process that was similar to the method of

Production Example 1, 6.17 g (0.04 mol) of diethyl sulfate and 34.7 g (0.35 mol) of 2-ethyl-2-oxazoline was dissolved in 83 g of dehydrated ethyl acetate, and the mixture was heated to reflux for 8 hours within nitrogen atmosphere to synthesize end-reactive poly (N-propionyl ethyleneimine). The number average molecular weight thereof was measured by GPC, and was 1,000. 33% ethyl acetate solution of 100 g of a side-chain primary aminopropyl modified polydimethyl siloxane (weight average molecular weight: 30,000, amine equivalent: 2,000) was added to this product at one time, and then was heated to reflux for 10 hours. The reaction mixture was concentrated under reduced pressure to obtain N-propionyl ethyleneimine-dimethylsiloxane copolymer as a pale yellow rubber-like semisolid (141 g, yield 97%). The content of the organo polysiloxane segment in the final product was 71% by mass (a/b = 71/29), and the weight average molecular weight (Mwt) of the organo polysiloxane was 42,000. It was found from the result of neutralization titration with hydrochloric acid employing methanol as a solvent that residual amino group of approximately 20% by mol was present.

[0071]

Production Example 3 (Production 3 of N-propionyl polyethyleneimine methyl polysiloxane copolymer)

According to a method that was similar to the method of Production Example 1, Poly(N-propionyl ethyleneimine) having number average molecular weight of 5200 was obtained from 3.2 g (0.021 mol) of diethyl sulfate and 92.8 g (0.98 mol) of 2-ethyl-2-oxazoline, and 205 g of dehydrated ethyl acetate. Further, 100 g

of a side-chain primary aminopropyl-modified polydimethyl siloxane (weight average molecular weight: 50,000, amine equivalent: 3,800) was employed to obtain N-propionyl ethyleneimine-dimethylsiloxane copolymer, as a pale yellow rubber-like solid (188 g, yield 96%).

5 The content of the organo polysiloxane segment in the final product was 51% by mass ($a/b = 51/49$), and the weight average molecular weight (Mwt) of the organo polysiloxane was 98,000. It was found from the result of neutralization titration with hydrochloric acid employing methanol as a solvent that residual
10 amino group of approximately 24% by mass was present.

[0072]

(Examples 1 to 36 and Comparative Examples 1 to 11)

The skin cosmetic compositions of formulations represented in Table 1 to Table 4 were produced, and a persistence of
15 ultraviolet protective ability, a feel of use (less stickiness, degree of smooth and dry, persistence of smooth and dry) and a redispersibility of powder (redispersibility index) were evaluated by methods as will be described later. The results are all represented in Table 1 to Table 4.

20 [0073]

(Preparation method)

All components except the propellant were mixed, and were dispersed in DISPER to prepare a stock solution.

A pressure vessel is filled with the obtained stock solution
25 with the propellant (LPG) to obtain an aerosol preparation of the skin cosmetic composition.

[0074]

(Method for evaluating)

(Persistence of ultraviolet protective ability)

28.5 +/- 0.5 mg of each of the samples (stock solutions) was spotted over a polymethyl methacrylate (PMMA) plate (50 mm x 50 mm) with a syringe, and the sample was uniformly spread over the plate by using a forefinger, which was preliminarily saturated with the sample. Then, the plate was stored in a light-shielded box at a room temperature for 15 minutes, and in vitro SPF was measured with UV-2000SSPF analyzer (commercially available from Labsphere).

A water resistance test was examined by using a beaker of 3 liters that filled with 2.5 liters of distilled water at a room temperature. The PMMA plate was fixed onto a wall of the beaker with a spacer, and then water was continually stirred (270 rpm/min) by using an electromagnetic agitator, so that an optimum laminar flow was certainly created around the plate. After the sample was immersed for 60 minutes, the sample was brought out, and was dried at a room temperature for 60 minutes, and then in vitro SPF was measured again, and SPF persistence (%) was calculated based on the following formula. Also, water resistance was evaluated by the following criterion based on the obtained value. Higher value indicates higher water resistance, and thus higher persistence of the ultraviolet protective ability.

SPF persistence (%) = (SPF value after water treatment/SPF value before water treatment) x 100

[0075]

(Feel of use: Less stickiness)

Three specialized panelists evaluated the level of less stickiness according to the following criteria when the respective aerosol products were sprayed over his/her arm for one second, and average value thereof was derived.

- 5 5: None of stickiness is felt.
- 4: Almost none of stickiness is felt.
- 3: Stickiness is not moderately felt.
- 2: Stickiness is felt to present discomfort feel.
- 1: Very much sticky, and considerable discomfort feel is felt.

10 [0076]

(Feel of use: Level of smooth and dry feel)

Three specialized panelists evaluated the level of the smooth and dry feel according to the following criteria when the respective aerosol products were sprayed over his/her arm for one
15 second, and average value thereof was derived.

- 5: Very smooth and dry
- 4: Smooth and dry
- 3: Moderately smooth and dry
- 2: Hardly smooth and dry
- 20 1: Not smooth and dry

[0077]

(Feel of use: Level of persistence of smooth and dry feel)

Three specialized panelists evaluated the level of smooth and dry feel according to the following criteria when the
25 respective aerosol products were sprayed over his/her arm for one second and then were spread over the arm for 5 times, and average value thereof was derived.

5: Very smooth and dry

4: Smooth and dry

3: Moderately smooth and dry

2: Hardly smooth and dry

5 1: Not smooth and dry

[0078]

(Redispersibility of powder)

An aerosol product was allowed to stand in a temperature-controlled room at 20 degrees C for one day to allow powder being
10 settled on the bottom of a container, and the container was tipped over sideways from the upright position, and number of times when it was estimated to achieve a uniform dispersion was measured by a visual observation. Then, the redispersibility index was
calculated based on the following formula. Higher value indicates
15 that the powder is redispersed in shorter time, and thus indicates better redispersibility of the powder.

Redispersibility index = $(1/\text{number of times}) \times 100$.

[0079]

TABLE 1

		NUMBER AVERAGE PARTICLE DIAMETER OF POWDER (µm)	EXAMPLE 1	EXAMPLE 2	EXAMPLE 30	EXAMPLE 31	EXAMPLE 32	EXAMPLE 33	EXAMPLE 34	EXAMPLE 35	EXAMPLE 36	EXAMPLE 3	EXAMPLE 4
COMPOSITION (STOCK SOLUTION)	(A)	2-ETHYLHEXYL-P-METHOXYCINNAMATE *1	6.44	6.44	6.44	6.44	6.44	6.44	6.44	6.44	7.68	6.44	6.44
		MIXTURE (64/36) OF 2-ETHYLHEXYL-P-METHOXYCINNAMATE/ DIETHYLAMINO HYDROXYBENZOYL HEXYL BENZOATE *2	5.56	5.56	5.56	5.56	5.56	5.56	5.56	5.56	6.67	5.56	5.56
	(B)	N-PROPIONYL POLYETHYLENEIMINE-METHYL POLYSILOXANE COPOLYMER (PRODUCTION EXAMPLE 1) *3	1	1	1	1	1	1	1	1	1	0.5	1
		N-PROPIONYL POLYETHYLENEIMINE-METHYL POLYSILOXANE COPOLYMER (PRODUCTION EXAMPLE 2) *4											
		N-PROPIONYL POLYETHYLENEIMINE-METHYL POLYSILOXANE COPOLYMER (PRODUCTION EXAMPLE 3) *5											
	(B')	(EICOSENE / VINYLPIRROLIDONE) COPOLYMER *6											
		(ACRYLATES /C12-22ALKYL METHACRYLATES) COPOLYMER *7											
		POLYACRYLATE-15/17 *8											
		DEXTRIN ISOSTEARATE *9											
	(C)	ETHANOL	82.5	83.5	76.5	78.5	80.5	84	82	81.5	79.65	85	84.5
	(D1)	METHYLSILOXANE NETWORK POLYMER *10	4.5	2	2	2	2	2	2	2	2	2	2
		NYLON POWDER *11	5										
		CROSS-LINKED ALKYL POLYACRYLATE *12	4										
		CROSS-LINKED ALKYL POLYACRYLATE *13	8										
	(D2)	CROSS-LINKED ALKYL POLYACRYLATE *14	20	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5
		ETHYLENE POWDER *15	13										
		NYLON POWDER *16	20										
		STYRENE-ACRYLIC ACID COPOLYMER *17	0.3										
	(F)	POLYOXYBUTYLENE POLYETHYLENE POLYOXYPROPYLENE GLYCERYL ETHER (8EO) (5PO) (3BO) *18	2	1	2	2	2	0.5	2.5	3	2.5		
		PURIFIED WATER			6	4	2						
	TOTAL		100	100	100	100	100	100	100	100	100	100	100
	TOTAL AMOUNT OF COMPONENT (A)		12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	14.4	12.0	12.0
	(D1)/(D2)		4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
	(D1)+(D2)		2.5	2.5	2.5	2.5	2.5	2.5	2.5	2.5	2.5	2.5	2.5
	(B)/(D1)+(D2))		0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.2	0.4
	(A)/(F)		6.0	12.0	6.0	6.0	6.0	24.0	4.8	4.0	5.7	-	-
SKIN COSMETIC COMPOSITION		COMPOSITION (STOCK SOLUTION)	40	40	40	40	40	40	40	40	40	40	40
	(E)	PROPELLANT	60	60	60	60	60	60	60	60	60	60	60
	TOTAL		100	100	100	100	100	100	100	100	100	100	100
RESULT OF EVALUATION		PERSISTENCE OF ULTRAVIOLET PROTECTIVE ABILITY (%)	92	93	93	90	91	91	92	92	93	85	91
		FEEL OF USE (LESS STICKINESS)	5	4	5	5	5	4	5	4	5	4	4
		FEEL OF USE (LEVEL OF SMOOTH AND DRY FEEL)	5	5	5	5	5	5	4	4	5	5	5
		FEEL OF USE (PERSISTENCE OF SMOOTH AND DRY FEEL)	5	5	5	5	5	5	4	4	5	4	5
		REDISPERSIBILITY OF POWDER (REDISPERSIBILITY INDEX)	33.3	25.0	33.3	33.3	33.3	33.3	33.3	25.0	25.0	25.0	33.3

[0080]

TABLE 2

		NUMBER AVERAGE PARTICLE DIAMETER OF POWDER (μm)	EXAMPLE	EXAMPLE	EXAMPLE	EXAMPLE	EXAMPLE	EXAMPLE	EXAMPLE	EXAMPLE	EXAMPLE	EXAMPLE	EXAMPLE	EXAMPLE	EXAMPLE	EXAMPLE	EXAMPLE	EXAMPLE
			5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
COMPOSITION (STOCK SOLUTION)	(A)	2-ETHYLHEXYL-P-METHOXYCINNAMATE *1 MIXTURE (64/36) OF 2-ETHYLHEXYL-P-METHOXYCINNAMATE/ DIETHYLAMINO HYDROXYBENZOYL HEXYL BENZOATE *2	6.44	6.44	6.44	6.44	6.44	6.44	6.44	6.44	6.44	4.29	5.06	6.44				
	(B)	N-PROPYL POLYETHYLENEIMINE-METHYL POLYSILOXANE COPOLYMER (PRODUCTION EXAMPLE 1) *3 N-PROPYL POLYETHYLENEIMINE-METHYL POLYSILOXANE COPOLYMER (PRODUCTION EXAMPLE 2) *4 N-PROPYL POLYETHYLENEIMINE-METHYL POLYSILOXANE COPOLYMER (PRODUCTION EXAMPLE 3) *5	2			1	1	1	1	1	1	1	1	1	1	1	1	1
	(B')	(EICOSENE / VINYLPIRROLIDONE) COPOLYMER *6 (ACRYLATES /C12-22 ALKYL METHACRYLATES) COPOLYMER *7 POLYACRYLATE-15/17 *8 DEXTRIN ISOSTEARATE *9																
	(C)	ETHANOL	83.5	84.5	84.5	83.25	84.5	84.5	84.5	84.5	84.5	88.5	84.5	85.8				
	(D1)	METHYLSILOXANE NETWORK POLYMER *10	4.5	2	2	3	1.25	2.25		2		2	2	0.96				
		NYLON POWDER *11	5						2									
		CROSS-LINKED ALKYL POLYACRYLATE *12	4															
		CROSS-LINKED ALKYL POLYACRYLATE *13	8															
	(D2)	CROSS-LINKED ALKYL POLYACRYLATE *14	20	0.5	0.5	0.75	1.25	0.25			0.5	0.5	0.5	0.24				
		ETHYLENE POWDER *15	13						0.5	0.5								
	(D')	NYLON POWDER *16	20															
	(F)	STYRENE-ACRYLIC ACID COPOLYMER *17 POLYOXYBUTYLENE POLYETHYLENE POLYOXYPROPYLENE GLYCERYL ETHER (8EO) (6PO) (3EO) *18	0.3															
	PURIFIED WATER																	
	TOTAL		100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100
	TOTAL AMOUNT OF COMPONENT (A)		12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	8.0	12.0	12.0	12.0	12.0	12.0	12.0
	(D1)/(D2)		4.0	4.0	4.0	4.0	1.0	9.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
	(D1)+(D2)		2.5	2.5	2.5	3.8	2.5	2.5	2.5	2.5	2.5	2.5	2.5	2.5	2.5	2.5	2.5	1.2
	(B)/(D1)+(D2))		0.8	0.4	0.4	0.3	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.8
	(A)/(F)		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
SKIN COSMETIC COMPOSITION	COMPOSITION (STOCK SOLUTION)		40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40
	PROPPELLANT		60	60	60	60	60	60	60	60	60	60	60	60	60	60	60	60
	TOTAL		100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100
RESULT OF EVALUATION	PERSISTENCE OF ULTRAVIOLET PROTECTIVE ABILITY (%)		96	85	78	93	93	90	91	92	91	92	90	92	90	92	90	92
	FEEL OF USE (LESS STICKINESS)		4	4	4	5	4	5	4	4	4	4	3	3	3	3	3	3
	FEEL OF USE (LEVEL OF SMOOTH AND DRY FEEL)		4	5	5	5	3	5	4	4	4	5	4	4	4	4	4	4
	FEEL OF USE (PERSISTENCE OF SMOOTH AND DRY FEEL)		4	4	4	5	3	5	4	4	4	5	4	4	4	4	4	4
	REDISPERSIBILITY OF POWDER (REDISPERSIBILITY INDEX)		33.3	25.0	33.3	14.3	11.1	9.1	25.0	20.0	14.3	20.0	25.0	20.0	25.0	20.0	25.0	50.0

[0081]

TABLE 3

		NUMBER AVERAGE PARTICLE DIAMETER OF POWDER (µm)	EXAMPLE 17	EXAMPLE 18	EXAMPLE 19	EXAMPLE 20	EXAMPLE 21	EXAMPLE 22	EXAMPLE 23	EXAMPLE 24	EXAMPLE 25	EXAMPLE 26	EXAMPLE 27	EXAMPLE 28	EXAMPLE 29
			6.44	6.44	6.44	6.44	6.44	6.44	6.44	6.44	6.44	6.44	6.44	6.44	6.44
COMPOSITION (STOCK SOLUTION)	(A)	2-ETHYLHEXYL-P-METHOXYCINNAMATE *1	6.44	6.44	6.44	6.44	6.44	6.44	6.44	6.44	6.44	6.44	6.44	6.44	6.44
		MIXTURE (64/36) OF 2-ETHYLHEXYL-P-METHOXYCINNAMATE/ DIETHYLAMINO HYDROXYBENZOYL HEXYL BENZOATE *2	5.56	5.56	5.56	5.56	5.56	5.56	5.56	5.56	5.56	5.56	5.56	5.56	5.56
		N-PROPIONYL POLYETHYLENEMINE-METHYL POLYSILOXANE COPOLYMER (PRODUCTION EXAMPLE 1) *3	1	1	1	0.5	1.3	1.5	0.2	1.2	0.8	1	1	1	1
	(B)	N-PROPIONYL POLYETHYLENEMINE-METHYL POLYSILOXANE COPOLYMER (PRODUCTION EXAMPLE 2) *4													
		N-PROPIONYL POLYETHYLENEMINE-METHYL POLYSILOXANE COPOLYMER (PRODUCTION EXAMPLE 3) *5													
		(EICOSENE / VINYL PYRROLIDONE) COPOLYMER *6													
	(B')	(ACRYLATES /C12-22 ALKYL METHACRYLATES) COPOLYMER *7													
		POLYACRYLATE-15/17 *8													
		DEXTRIN ISOSTEARATE *9													
	(C)	ETHANOL	78	85.4	83.5	84.5	84.5	84.5	84.5	83.8	85.2	84.5	84.5	84.5	84.5
		METHYLSILOXANE NETWORK POLYMER *10	4.5	7.2	2.4	2.4	1.76	1.6	2.64	2.4	1.6			2	
	(D1)	NYLON POWDER *11	5												
		CROSS-LINKED ALKYL POLYACRYLATE *12	4									2			
		CROSS-LINKED ALKYL POLYACRYLATE *13	8										2		2
		CROSS-LINKED ALKYL POLYACRYLATE *14	20	1.8	1.1	0.6	0.44	0.4	0.66	0.6	0.4	0.5	0.5		
	(D2)	ETHYLENE POWDER *15	13												
		NYLON POWDER *16	20											0.5	0.5
	(D')	STYRENE-ACRYLIC ACID COPOLYMER *17	0.3												
	(F)	POLYOXYBUTYLENE POLYETHYLENE POLYOXYPROPYLENE GLYCERYL ETHER (8EO) (5PO) (3BO) *18													
SKIN COSMETIC COMPOSITION		PURIFIED WATER													
	TOTAL		100	100	100	100	100	100	100	100	100	100	100	100	100
	TOTAL AMOUNT OF COMPONENT (A)		12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0
	(D1)/(D2)		4.0	5.7	2.2	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
RESULT OF EVALUATION	(D1)+(D2)		9.0	1.6	3.5	3.0	2.2	2.0	3.3	3.0	2.0	2.5	2.5	2.5	2.5
	(B)/(D1)+(D2))		0.1	0.6	0.3	0.2	0.6	0.8	0.1	0.4	0.4	0.4	0.4	0.4	0.4
	(A)/(F)		-	-	-	-	-	-	-	-	-	-	-	-	-
	COMPOSITION (STOCK SOLUTION)		40	40	40	40	40	40	40	40	40	40	40	40	40
	(E) PROPPELLANT		60	60	60	60	60	60	60	60	60	60	60	60	60
	TOTAL		100	100	100	100	100	100	100	100	100	100	100	100	100
RESULT OF EVALUATION	PERSISTENCE OF ULTRAVIOLET PROTECTIVE ABILITY (%)		93	91	92	87	93	94	80	92	90	92	93	91	91
	FEEL OF USE (LESS STICKINESS)		5	4	5	4	4	4	5	4	4	4	4	4	4
	FEEL OF USE (LEVEL OF SMOOTH AND DRY FEEL)		5	4	5	5	5	4	5	5	5	5	5	5	5
	FEEL OF USE (PERSISTENCE OF SMOOTH AND DRY FEEL)		4	4	5	4	5	4	3	5	5	5	5	5	5
	REDISPERSIBILITY OF POWDER (REDISPERSIBILITY INDEX)		7.7	33.3	10.0	20.0	20.0	33.3	12.5	16.7	33.3	25.0	20.0	14.3	25.0

[0082]

TABLE 4

		NUMBER AVERAGE PARTICLE DIAMETER OF POWDER (µm)	COM- PARATIVE EXAMPLE 1	COM- PARATIVE EXAMPLE 2	COM- PARATIVE EXAMPLE 3	COM- PARATIVE EXAMPLE 4	COM- PARATIVE EXAMPLE 5	COM- PARATIVE EXAMPLE 6	COM- PARATIVE EXAMPLE 7	COM- PARATIVE EXAMPLE 8	COM- PARATIVE EXAMPLE 9	COM- PARATIVE EXAMPLE 10	COM- PARATIVE EXAMPLE 11
			6.44	6.44	6.44	6.44	6.44	6.44	6.44	6.44	6.44	6.44	6.44
COMPOSITION (STOCK SOLUTION)	(A)	2-ETHYLHEXYL-P-METHOXYCINNAMATE *1 MIXTURE (64/36) OF 2-ETHYLHEXYL-P-METHOXYCINNAMATE/ DIETHYLAMINO HYDROXYBENZOYL HEXYL BENZOATE *2	5.56	5.56	5.56	5.56	5.56	5.56	5.56	5.56	5.56	5.56	5.56
	(B)	N-PROPIONYL POLYETHYLENEMINE-METHYL POLYSILOXANE COPOLYMER (PRODUCTION EXAMPLE 1) *3	1	1	1	1	1	1	1	1	1	1	1
	(B)	N-PROPIONYL POLYETHYLENEMINE-METHYL POLYSILOXANE COPOLYMER (PRODUCTION EXAMPLE 2) *4											
	(B)	N-PROPIONYL POLYETHYLENEMINE-METHYL POLYSILOXANE COPOLYMER (PRODUCTION EXAMPLE 3) *5											
	(B)	(EICOSENE / VINYLPIRROLIDONE) COPOLYMER *6 (ACRYLATES (C12-22ALKYL METHACRYLATES) COPOLYMER *7 POLYACRYLATE-15/17 *8 DEXTRIN ISOSTEARATE *9								1		1	1
	(C)	ETHANOL	85.5	84.5	84.5	84.5	84.5	84.5	84.5	84.5	84.5	84.5	84.5
	(D1)	METHYLSILOXANE NETWORK POLYMER *10	4.5	2	2.42	0.5				2	2	2	2
	(D1)	NYLON POWDER *11	5										
	(D1)	CROSS-LINKED ALKYL POLYACRYLATE *12	4				2.5						
	(D1)	CROSS-LINKED ALKYL POLYACRYLATE *13	8										
	(D2)	CROSS-LINKED ALKYL POLYACRYLATE *14	20	0.5	0.08	2	2.5	1.25	0.5	0.5	0.5	0.5	0.5
	(D2)	ETHYLENE POWDER *15	13					1.25					
	(D)	NYLON POWDER *16	20										
	(D)	STYRENE-ACRYLIC ACID COPOLYMER *17	0.3						2				
	(F)	POLYOXYBUTYLENE POLYETHYLENE POLYOXYPROPYLENE GLYCERYL ETHER (8EO) (5PO) (3BO) *18											
		PURIFIED WATER											
SKIN COSMETIC COMPOSITION	TOTAL		100	100	100	100	100	100	100	100	100	100	100
	TOTAL AMOUNT OF COMPONENT (A)		12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0
	(D1)/(D2)		4.0	30.3	0.3	0.0	-	0.0	0.0	4.0	4.0	4.0	4.0
RESULT OF EVALUATION	(D1)+(D2)		2.5	2.5	2.5	2.5	2.5	2.5	0.5	2.5	2.5	2.5	2.5
	(B)/((D1)+(D2))		0.0	0.4	0.4	0.4	0.4	0.4	2.0	0.0	0.0	0.0	0.0
	(A)/(F)		-	-	-	-	-	-	-	-	-	-	-
	COMPOSITION (STOCK SOLUTION)		40	40	40	40	40	40	40	40	40	40	40
	PROPPELLANT		60	60	60	60	60	60	60	60	60	60	60
PERSISTENCE OF ULTRAVIOLET PROTECTIVE ABILITY (%)	TOTAL		100	100	100	100	100	100	100	100	100	100	100
	FEEL OF USE (LESS STICKINESS)		59	92	91	92	92	90	91	95	98	88	87
	FEEL OF USE (LEVEL OF SMOOTH AND DRY FEEL)		4	4	2	2	4	2	2	1	2	1	2
	FEEL OF USE (PERSISTENCE OF SMOOTH AND DRY FEEL)		5	5	2	2	4	2	2	3	3	3	3
	REDISPERSIBILITY OF POWDER (REDISPERSIBILITY INDEX)		1	5	2	2	4	2	2	3	3	3	3
REDISPERSIBILITY OF POWDER (REDISPERSIBILITY INDEX)			25.0	5.9	4.5	4.0	4.3	5.6	3.4	16.7	20.0	14.3	12.5

[0083]

Components employed in Examples or Comparative Examples are shown below.

5 *1 2-ethylhexyl-p-methoxycinnamate: Uvinul MC80, commercially

available from BASF

*2 Mixture of 2-ethylhexyl-p-methoxycinnamate/diethylamino hydroxybenzoyl hexyl benzoate (64/36): Uvinul A PLUS B, commercially available from BASF

5 *3 N-propionyl polyethyleneimine-methyl polysiloxane copolymer: product obtained in Production Example 1, a/b = 88/12

*4 N-propionyl polyethyleneimine-methyl polysiloxane copolymer: product obtained in Production Example 2, a/b = 71/29

10 *5 N-propionyl polyethyleneimine-methyl polysiloxane copolymer: product obtained in Production Example 3, a/b = 51/49

*6 (Eicosene / vinylpyrrolidone) copolymer: Antaron V-220, commercially available from ISP Japan company

*7 (Acrylates /C12-22 alkyl methacrylates) copolymer: SOLTEX OPT, commercially available from The Dow Chemical Company

15 *8 Polyacrylate-15/17: SYNTRAN PC 5527, commercially available from Interpolymer

*9 Dextrin isostearate: Unifilma HVY, commercially available from Chiba Flour Milling Co., Ltd.

20 *10 Methylsiloxane network polymer: Tospearl 145A, commercially available from Momentive Performance Materials Japan

*11 Nylon powder: Nylon SP-500, commercially available from Toray Corporation

*12 Cross-linked alkyl polyacrylate: Matsumoto microsphere M201, commercially available from Matsumoto Yushi Seiyaku Corporation

25 *13 Cross-linked alkyl polyacrylate: Matsumoto microsphere M305, commercially available from Matsumoto Yushi Seiyaku Corporation

*14 Cross-linked alkyl polyacrylate: Matsumoto microsphere M503B,

commercially available from Matsumoto Yushi Seiyaku Corporation

*15 Ethylene powder: Flow Beads CL3080, commercially available from Sumitomo Seika Chemicals Co., Ltd.

*16 Nylon powder: Nylon TR-2, commercially available from Toray Corporation

*17 Styrene-acrylic acid copolymer: Rohmsphere Powder, commercially available from Rohm and Haas Japan

*18 Polyoxybutylene polyethylene polyoxypropylene glyceryl ether (8EO) (5PO) (3BO): Wilbride S-753, commercially available from NOF Corp.

[0084]

Since the components (A) to (C), (D1), (D2) and (E) are contained and the content of the component (C) and the mass ratio of the component (D1) and the component (D2) are within the specific ranges according to Table 1 to Table 4, the cosmetic compositions, which exhibit an enhanced persistence of the ultraviolet protective ability and an enhanced balance of the feel of use in terms of the less stickiness, the smooth and dry feel and the persistent thereof, as compared with the products described in respective Comparative Examples, were obtained. In addition, the cosmetic compositions described in respective Examples exhibited a better redispersibility of the powder components in the cosmetic composition, in comparison the products described in respective Comparative Examples.

[0085]

(Prescription Examples 1 and 2)

Prescription Examples of the skin cosmetic compositions are

shown in Table 5.

[0086]

TABLE 5		PREScription EXAMPLE 1	PREScription EXAMPLE 2
COMPOSITION (STOCK SOLUTION)	2-ETHYLHEXYL-p-METHOXYCINNAMATE (UVINUL MC80, COMMERCIALY AVAILABLE FROM BASF)	6.44	6.44
	MIXTURE OF 2-ETHYLHEXYL-p-METHOXYCINNAMATE/DIETHYLAMINO HYDROXYBENZOYL HEXYL BENZOATE (64/36) (UVINUL A PLUS B, COMMERCIALY AVAILABLE FROM BASF)	5.56	5.56
	2,4-BIS - [(4- (2-ETHYLHEXYLOXY) -2- HYDROXY} - PHENYL]-6-(4-METHOXYPHENYL) -1,3,5-TRIAZINE (TINOSORB S, COMMERCIALY AVAILABLE FROM BASF)	0.3	0.5
	2,4,6-TRIS [4-(2-ETHYLHEXYL OXYCARBONYL) ANILINO]-1,3,5-TRIAZINE (UVINUL T150, COMMERCIALY AVAILABLE FROM BASF)	0.5	1
	N-PROPIONYL POLYETHYLENIMINE-METHYL POLYSILOXANE COPOLYMER (PRODUCTION EXAMPLE 1, a/b = 88/12)	0.8	0.6
	99 % SYNTHETIC ALCOHOL	74.8	42.85
	POLYOXYBUTYLENE POLYETHYLENE POLYOXYPROPYLENE GLYCERYL ETHER (8EO) (5PO) (3BO) (WILBRIDE S-753, COMMERCIALY AVAILABLE FROM NOF CORP.)	1.0	2
	ALKYL BENZOATE (FINSOLV TN, COMMERCIALY AVAILABLE FROM INNOSPEC ACTIVE CHEMICALS LLC)	3.0	5
	LIGHT ISOPARAFFIN (MARUKASOL R, COMMERCIALY AVAILABLE FROM MARUZEN PETROCHEMICAL)		30
	METHYL POLYCYCLOSIOXANE (SILICONE TSF405A, COMMERCIALY AVAILABLE FROM MOMENTIVE PERFORMANCE MATERIALS JAPAN)	5.0	2
	METHYLSILOXANE NETWORK POLYMER (TOSPEARL 145A, COMMERCIALY AVAILABLE FROM MOMENTIVE PERFORMANCE MATERIALS JAPAN)	2.00	3
	CROSS-LINKED ALKYL POLYACRYLATE (MATSUMOTO MICROSPHERE M503B, COMMERCIALY AVAILABLE FROM MATSUMOTO YUSHI SEIYAKU CORPORATION)	0.50	1
	FLAVOR	0.10	0.05
— — SUBTOTAL — —		100.00	100.00
COMPOSITION (STOCK SOLUTION)		40	30
PROPELLANT		60	70
TOTAL		100	100

CLAIMS

1. A skin cosmetic composition comprising components (A), (B), (C), (D1), (D2) and (E):

5 (A) an ultraviolet protective agent;

(B) a polymer comprising constitutional units of a hydrophilic segment having an N-acyl alkyleneimine as its repeating unit and an organo polysiloxane segment;

10 (C) an alcohol having carbon atom(s) of equal to or larger than 1 and equal to or smaller than 4;

(D1) a powder having number average particle size of equal to or larger than 1 μm and equal to or smaller than 10 μm ;

(D2) a powder having number average particle size of larger than 10 μm and equal to or smaller than 25 μm ; and

15 (E) a propellant,

wherein a content of the component (C) in all components of the skin cosmetic composition except the component (E) is equal to or higher than 40 % by mass and equal to or lower than 95 % by mass, and

20 wherein a mass ratio of the component (D1) to the component (D2) in the skin cosmetic composition is presented as:
(Component (D1)/Component (D2)) = 1/2 to 20/1.

2. The skin cosmetic composition according to claim 1, wherein
25 a total amount of contents of the component (D1) and the component (D2) in all components of the skin cosmetic composition except the component (E) is equal to or higher than 0.5 % by mass and equal

to or lower than 10 % by mass.

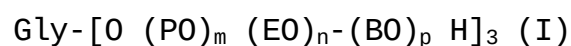
3. The skin cosmetic composition according to claim 1 or 2, wherein the component (D1) or the component (D2) is a nylon powder, an ethylene powder, a silicone powder, a polymethyl methacrylate powder, or a powder of one, two or more of polymer(s) or copolymer(s) selected from acrylic acid, methacrylic acid, alkyl acrylate, alkyl methacrylate, alkylene glycol acrylate and alkylene glycol methacrylate.

10

4. The skin cosmetic composition according to any one of claims 1 to 3, wherein a mass ratio $((B) / [(D1) + (D2)])$ of the component (B) to the total amount of the components (D1) and (D2) is equal to or higher than 0.05 and equal to or lower than 1.

15

5. The skin cosmetic composition according to any one of claims 1 to 4, further comprising (F) an alkylene oxide derivative represented by the following general formula (I) at equal to or higher than 0.1 % by mass and equal to or lower than 3 % by mass in all components except the component (E):



wherein, in the above-described general formula (I), Gly is a residue of eliminating hydroxyl group from glycerin, P0 is an oxypropylene group, and E0 is an oxyethylene group. m and n are average molar numbers of added E0 and P0, respectively, and have a value of from 1 to 50, and the mass ratio (P0/E0) of P0 to E0 is from 1/5 to 5/1. B0 is an oxyalkylene group having 4 carbon atoms.

25

p is an average molar number of added B_0 and has a value of from 0.5 to 5.