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(54) Title: A COSMETIC COMPOSITION

(57) Abstract: The present invention relates to cosmetic compositions formulated at low pH like those comprising antiperspirant actives for providing enhanced whiteness to the skin surface. It is achieved by including an optical particle and a film forming polymer in a base emulsion comprising hydrophobically modified silica, aminofunctional silicone and water.

A COSMETIC COMPOSITION

Field of the invention

The present invention is in the field of cosmetic compositions, in particular compositions comprising antiperspirant actives. The present invention more particularly relates to providing enhanced whiteness to the skin surface in addition to anti-perspirancy benefits.

Background of the invention

The present invention relates to cosmetic compositions, which are formulated at low pH in the range of 2 to 6. One class of such compositions are those that contain antiperspirant actives. These actives are added to compositions to reduce perspiration on application to the surface of the body, particularly to the underarm regions of the human body. Antiperspirant actives are typically astringent metal salts such as aluminium or zirconium salts. Such salts are incorporated in compositions at low pH in the range of 2 to 6. It has been found that in addition to looking for good anti-perspirancy benefits especially in the underarm region, consumers also seek to have an enhanced whiteness on such surfaces. Yet, there is a need to provide compositions that in addition to anti-perspirancy also deliver enhanced whiteness that is visible even for long time after the composition is applied to the skin.

The present inventors have now developed a composition in which such low pH anti-perspirant actives can be incorporated along with whitening optical particles and these can be delivered in a composition comprising an emulsion comprising hydrophobically modified silica, amino-functionalised silicone and water along with a film forming polymer of select classes.

The present applicants have disclosed mild emulsions comprising hydrophobically modified silica, amino-functionalised silicone and water which has been published as WO2013064367. In other co-pending applications, they have disclosed various other uses of this emulsion. But so far it has not been disclosed that this emulsion can be used to incorporate low pH actives like anti-perspirancy actives along with optical particles and the whiteness can be perceived over long time through incorporation of film forming polymers.

It is thus an object of the present invention to provide for a low pH cosmetic composition where optical particles deliver enhanced whitening over long period of time.

Summary of the invention

According to the first aspect of the present invention there is provided a cosmetic composition comprising an emulsion comprising

(i) hydrophobically modified silica;

(ii) amino functionalized silicone; and

(iii) water;

the cosmetic composition further comprising

(iv) an optical particle;

(v) a film forming polymer selected from an acrylate polymer, a methacrylate polymer, a urethane polymer, aliphatic polyurethane resin, silicone resin, polyquaternium or co-polymers thereof.

wherein the pH of the composition at 25°C is from 2 to 6.

It is particularly preferred that the pH of the composition is from 2 to 4.

According to another aspect of the present invention there is provided a method of lightening skin comprising the step of topically applying to the skin the composition of the first aspect.

Detailed description of the invention

These and other aspects, features and advantages will become apparent to those of ordinary skill in the art from a reading of the following detailed description and the appended claims. For the avoidance of doubt, any feature of one aspect of the present invention may be utilized in any other aspect of the invention. The word “comprising” is intended to mean “including” but not necessarily “consisting of” or “composed of.” In other words, the listed steps or options need not be exhaustive. It is noted that the examples given in the description below are intended to clarify the invention and are not intended to limit the invention to those examples per se. Similarly, all percentages are weight/weight percentages unless otherwise indicated. Except in the operating and

comparative examples, or where otherwise explicitly indicated, all numbers in this description and claims indicating amounts of material or conditions of reaction, physical properties of materials and/or use are to be understood as modified by the word “about”. Numerical ranges expressed in the format "from x to y" are understood to include x and y. When for a specific feature multiple preferred ranges are described in the format "from x to y", it is understood that all ranges combining the different endpoints are also contemplated.

By “A Cosmetic Composition” as used herein, is meant to include a composition for topical application to the skin of mammals, especially humans. Such a composition is preferably of the leave-on type. By a leave-on composition is meant a composition that is applied to the desired skin surface and left on for a period of time (say from one minute to 24 hours) after which it may be wiped or rinsed off with water, usually during the regular course of personal washing. The composition may also be formulated into a product which is applied to a human body for improving the appearance, cleansing, odor control or general aesthetics. The composition of the present invention can be in the form of a liquid, lotion, cream, foam, scrub, gel or stick form and may be delivered through a roll-on device or using a propellant containing aerosol can. It is especially useful for delivering low pH compositions to the axilla of an individual for whitening benefits. “Skin” as used herein is meant to include skin on any part of the body (e.g., neck, chest, back, arms, underarms, hands, legs, buttocks and scalp) especially the underarms.

In addition to providing the whitening benefits, the cosmetic composition exhibits additional advantages like long lasting lightening of skin, translucence, pinkish white appearance and blurring.

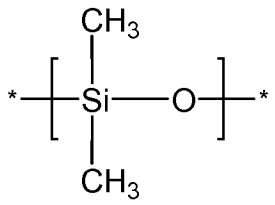
The cosmetic composition of the invention is delivered through an emulsion comprising hydrophobically modified silica, amino functionalized silicone; and water. The cosmetic composition further comprises an optical particle, a film forming polymer selected from an acrylate polymer, a methacrylate polymer, a urethane polymer, aliphatic polyurethane resin, silicone resin, polyquaternium or co-polymers thereof. The pH of the composition at 25°C is from 2 to 6. The pH is preferably from 2 to 4.

Hydrophobically Modified silica

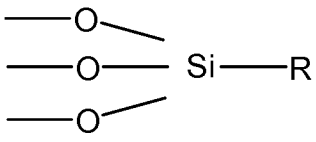
The only limitation with respect to the type of hydrophobically modified silica that may be used in this invention is that the same is suitable for use in an antiperspirant composition by consumers at a pH from 2 to 6.

In a preferred embodiment, the hydrophobically modified silica comprises at least one of the following groups:

$$- O - Si (CH_3)_3 \qquad (I)$$



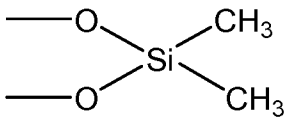
(II)



(III)

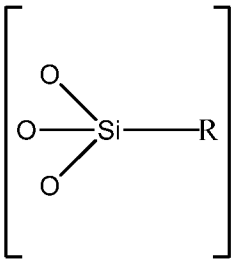
in which R is a C_4 to C_{18} alkyl group.

or



(IV)

The hydrophobically modified silica most preferably comprises



wherein R is a C_4 to C_{18} alkyl group, more preferably a C_8H_{17} alkyl group.

Such silicas are described in US 7 282 236 and made commercially available from suppliers like Evonik Degussa GmbH under the names Aerosil R805, Aerosil R972, Aerosil R 202, Aerosil R812, Aerosil R104, Aerosil R816 and Aerosil R711. Other silicas which may be used are available from Wacker under the names HDK H113L, HDK H15, HDK H20, and HDK H30. Preferably, the silica particles comprise the group represented by formula III. More preferably, the silica particles comprise octylsilane (sold under the name Aerosil R805).

The hydrophobically modified silica according to the present invention can be of different sizes and shapes. Particle size, as used herein, refers to particle diameter unless otherwise stated. Diameter is meant to mean the largest measurable distance on a particle in the event a well-defined sphere is not generated. Particle size can be measured, for example, by dynamic light scattering (DLS) or transmission electron microscope (TEM). The volume average primary particle size of hydrophobically modified silica is often from 1 nm to 100 nm, more preferably from 5 nm to 70 nm, most preferably from 5 nm to 20 nm, including all ranges subsumed therein.

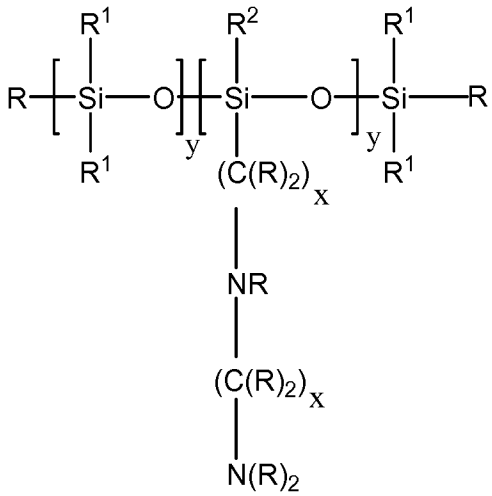
Typically, the antiperspirant composition of the present invention comprises from 0.05 to 20% by weight of the hydrophobically modified silica, more preferably from 0.05 to 15%, further more preferably from 0.1 to 10%, most preferably from 0.2 to 5% based on the total weight of the antiperspirant composition and including all ranges subsumed therein.

Amino Functionalized Silicone

The cosmetic composition of this invention comprises an amino functionalized silicone. By “amino functionalized silicone” is meant a silicone containing at least one primary, secondary or tertiary amine group, or a quaternary ammonium group.

The primary, secondary, tertiary and/or quaternary amine groups may either form part of the main polymer chain or more preferably be carried by a side or pendant group carried by the polymeric backbone. Such polymers are described, for example, in US 4 185 087.

In a preferred embodiment, the amino functionalized silicone has the general formula:



(V)

where:

each R is independently H, OH, OCH_3 or C_{1-4} alkyl;

each R^1 is independently OR, or a C_{1-4} alkyl;

each R^2 is independently OR, or a C_{1-4} alkyl; and

each x is independently an integer from 1 to 4 and each y is greater than zero and independently an integer to yield a polymer having a molecular weight from 500 to 1 million, and preferably, from 750 to 25,000, and most preferably from 1,000 to 15,000.

Other amino functionalized silicone suitable to use includes silicone cationic polymers represented by the formula:

$$R^2_aZ_{3-a}\text{-}Si(OSiZ_2)_n\text{-}(OSiZ_bR^2_{2-b})_m\text{-}O\text{-}SiZ_{3-a}\text{-}R^2_a \qquad (VI)$$

where:

Z is hydrogen, phenyl, OH or a C_1-C_{10} alkyl group;

each a is independently an integer from 0 to 3;

b is an integer from 0 to 1; and

m and n are integers whereby the sum of n+m ranges from 1 to 3,500, and preferably from 10 to 160;

each R^2 is independently a monovalent radical of formula $-C_qH_{2q}L$ where each q is independently a number from 2 to 10 and L is an amine or a quaternized amine represented by one of the following groups:

$-NR^3\text{-}CH_2\text{-}CH_2\text{-}N(R^3)_2$

$-N(R^3)_2$

$-N^{\oplus}(R^3)_3A^-$

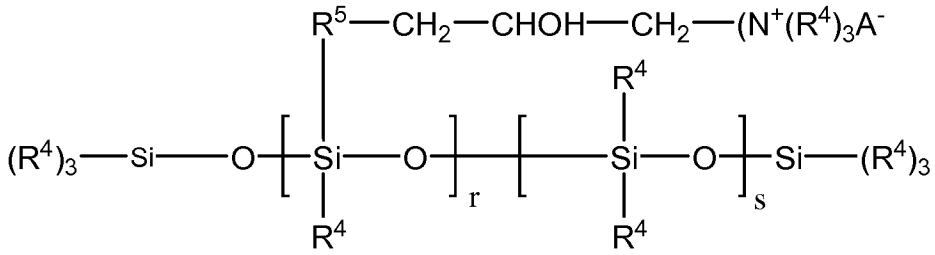
$-N(R^3)\text{-}CH_2\text{-}CH_2\text{-}N^+R^3(H)_2A^-$,

where:

each R^3 is independently hydrogen, phenyl, benzyl or a C_1 to C_{12} alkyl; and

each A^- is independently fluoride, chloride, bromide or iodide anion.

Still other amino functionalized silicone suitable for use includes those having the formula:



(VII)

where:

each R^4 is independently a C_1 to C_{20} alkyl or C_2 to C_{20} alkenyl;

R^5 is a divalent C_1-C_{18} group;

A^- is as previously defined;

r is an integer from 2 to 20; and

s is an integer from 15 to 75.

Preferably, the amino functionalized silicone has the INCI designation amodimethicone.

More preferably, the amodimethicone is represented by formula (V) and made commercially available, for example, as DC 8500 by Dow Corning. It is also within the scope of this invention for the amino functionalized silicone to comprise trimethylsilylamodimethicone represented by formula (VI).

Typically, the cosmetic composition of the present invention comprises amino functionalized silicone in an amount from 0.01 to 25%, more preferably from 0.03 to 15%, more preferably still from 0.05 to 10%, most preferably from 0.1 to 5% by total weight of the composition and including all ranges subsumed therein.

Preferably the weight ratio of hydrophobically modified silica to amino functionalized silicone is from 10:1 to 1:3, more preferably from 5:1 to 1:3 and most preferably from 2:1 to 1:2..

Typically, the cosmetic composition of the invention comprises an emulsion. Generally the water content is from 10 to 80%, more preferably from 15 to 70%, most preferably from 20 to 60% based on the total weight of the cosmetic composition and including all ranges subsumed therein.

Optical Particle

An optical particle, preferably a whitening particle, is included in the cosmetic composition of the invention. The optical particle is selected from one of a polymer bead or an inorganic particle with a refractive index higher than 1.8. When a polymer bead is included, it is preferably a hollow sphere. Suitable hollow spheres are those made of a styrene/ acrylate co-polymer, polyurethane, or polyethylene most preferably a styrene/ acrylate co-polymer. Polymer beads which may be included in the composition of the invention preferably have a particle size in the range of 80 to 700 nm. Commercially available hollow sphere polymer beads which may be used in the composition of the invention are Sunspheres™ (from Dow Chemicals). Alternatively and preferably the optical particles are inorganic particles with a refractive index higher than 1.8, preferably higher than 2.0, more preferably higher than 2.5. Preferred inorganic particles as per

the invention are titanium dioxide, zinc oxide, boron nitride, iron oxide, mica, mica coated with titanium dioxide or mixtures thereof, more preferred being titanium dioxide, zinc oxide, boron nitride or mixtures thereof. Most preferred inorganic particle is titanium dioxide. The optical particles for inclusion in the composition of the invention preferably have a mean particle size from 15 nm to 30 micron, preferably 15 nm to 1 micron, more preferably 80 to 400 nm. Commercially available titanium dioxide are available as Korons1171 from Korons and KowetTiO 203975 from Sensient, MT700Z from Tayca, and JTTO MS-7 from KOBO. The optical particle is preferably included in 0.1 to 20%, more preferably 0.2 to 10%, further more preferably 0.5 to 8% by weight of the composition.

The cosmetic composition of the invention comprises a film forming polymer selected from an acrylate polymer, a methacrylate polymer, a urethane polymer, aliphatic polyurethane resin, silicone resin, polyquaternium or co-polymers thereof.

"Film-forming polymer" as used herein refers to a polymer which is capable of forming a cohesive and continuous covering over the hair and/or skin when applied to the surface. Contact angle, as used herein, means the angle at which a water/vapor interface meets a solid surface at a temperature of 25°C. Such an angle may be measured with a goniometer or other water droplet shape analysis systems with water droplet of 5 µl and at 25°C. The requirement for film-forming polymer, as per the present invention is that the film-forming polymer is suitable to be employed in cosmetic composition. The film-forming polymer, for use in the present invention, preferably has a contact angle of at least 85°. The film forming polymer is generally water insoluble and is distinct from water soluble polymers like cross-linked polyacrylic acid polymers sold as Carbopol which are commonly used in cosmetic product as thickeners. The skilled person knows what is meant by the water-insolubility of a polymer. Preferably, the solubility of the polymer in water at 25 °C is less than 1 wt%, more preferably less than 0.5 wt%, even more preferably less than 0.1 wt% and most preferably less than 0.01 wt%. Especially preferred film forming polymers are acrylate co-polymer, silicone resin and a urethane-acrylic co-polymer. Commercially available film forming polymers which may be used in the present invention are KOBO-50N, KOBO-5400, and KOBO-HPRC available from Kobo; Hybridur 875 from Air Products; Dow-UPU-1 from Dow; Induchem-U6, Induchem-

U15, Induchem-U1946 from Induchem; PIB 1000 from Evonik; and MQ-1640 from Dow Corning. The film forming polymer is preferably included in 0.5-10%, more preferably 0.5 to 8%, even further more preferably 1-6%, most preferably 2-6% by weight of the composition.

Not wishing to be bound by theory, the inventors believe that the oil in water emulsion formed by the combination of the hydrophobic silica and the amino functionalized silicone with water in combination with the acidic condition in water continuous phase will prevent the film forming polymer to form a film directly on the skin surface. Rather, it is believed that the film forming can be better dispersed in the silicone oil which can be stable in the very acidic condition. Thus, the film forming polymer in the silicone oil phase can form a better film on the skin surface ensuring that the optical particles remain longer even at very acidic conditions and ensure enhanced resistance to rinsing with water.

Antiperspirant Skin Care Active

The cosmetic composition of the invention works in the pH range of 2 to 6. Typically the benefits of the present invention can be utilized when the composition comprises an anti-perspirant skin care active which are generally acidic substances. Typically, the antiperspirant actives which could be used herein are astringent active salts including aluminium, zirconium and mixed aluminium/zirconium salts. Such salts include both inorganic salts and salts with organic anions and complexes. Preferably, the antiperspirant actives are aluminium, zirconium and aluminium/zirconium halides and halohydrate salts, such as chlorohydrates and activated aluminium chlorohydrates.

Aluminium halohydrates are usually defined by the general formula $Al_2(OH)_xQ_y \cdot wH_2O$ in which Q represents chlorine, bromine or iodine, x is variable from 2 to 5 and x+y=6 while wH_2O represents a variable amount of hydration.

Zirconium actives can usually be represented by the empirical general formula: $ZrO(OH)_{2n-nz}B_z \cdot wH_20$ in which z is a variable in the range of from 0.9 to 2.0 so that the value 2n-nz is zero or positive, n is the valency of B, and B is selected from the group consisting of chloride, other halide, sulfamate, sulfate and mixtures thereof. Possible hydration to a variable extent is represented by wH_2O. In one embodiment B represents

chloride and the variable z lies in the range from 1.5 to 1.87. In practice, such zirconium salts are usually not employed by themselves, but as a component of a combined aluminium and zirconium-based antiperspirant.

The above aluminium and zirconium salts may have coordinated and/or bound water in various quantities and/or may be present as polymeric species, mixtures or complexes. In particular, zirconium hydroxy salts often represent a range of salts having various amounts of the hydroxy group. Aluminium zirconium chlorohydrate may be particularly preferred.

Antiperspirant complexes based on the above-mentioned astringent aluminium and/or zirconium salts can be employed. The complex often employs a compound with a carboxylate group, and advantageously this is an amino acid. Examples of suitable amino acids include dl-tryptophan, dl-β-phenylalanine, dl-valine, dl-methionine and β-alanine, and preferably glycine which has the formula $CH_2(NH_2)COOH$.

It is highly desirable to employ complexes of a combination of aluminium halohydrates and zirconium chlorohydrates together with amino acids such as glycine, examples of which are disclosed in U.S. Pat. No. 3,792,068 (Luedders et al).

Certain of those Al/Zr complexes are commonly called AZG in the literature. AZG actives generally contain aluminium, zirconium and chloride with an Al/Zr ratio in a range from 2 to 10, especially 2 to 6, an Al/Cl ratio from 2.1 to 0.9 and a variable amount of glycine. Actives of this type are available from suppliers that include Summit Reheis. In one preferred embodiment the active is enhanced activity or activated aluminium/zirconium halohydrate, in particular, activated aluminium-zirconium tetrachlorohydrex glycine (AAZG).

Other actives which may be utilized include astringent titanium salts, for example those described in GB 2299506A.

The antiperspirant skin care active is preferably selected from aluminium chlorohydrate, aluminum-zirconium tetrachlorohydrex glycine complex, aluminum-zirconium

octachlorohydrex glycine complex, aluminum-zirconium pentachlorohydrate, aluminum sesquichlorohydrate or mixtures thereof. More preferred antiperspirant actives are aluminum-zirconium tetrachlorohydrex glycine complex, aluminum-zirconium octachlorohydrex glycine complex, aluminum-zirconium pentachlorohydrate, aluminum sesquichlorohydrate or mixtures thereof. Most preferred is aluminum sesquichlorohydrate.

Preferably, the antiperspirant active comprises water soluble calcium salt, such as calcium chloride. It is particularly preferred that the antiperspirant active comprises water soluble calcium salt. Further preferably the antiperspirant active comprises an amino acid, such as glycine. It is especially preferred that the antiperspirant active is heated with the water soluble calcium salt and preferably amino acid prior to or during formulation of the antiperspirant composition. In this way, the antiperspirant active may become 'activated', that is to say, have higher antiperspirant efficacy.

When calcium-containing/activated antiperspirant actives are employed, it is preferred that the molar ratio of calcium to aluminium is at least 1:20, more preferably at least 1:15 and most preferably at least 1:10. In combination with each of these preferences, when an amino acid such as glycine is also included, it is preferred that the molar ratio of amino acid to aluminium is at least 1:20 and more preferably at least 1:10.

When calcium-containing/activated antiperspirant actives are employed, particularly at any of the preferred molar ratios of calcium to aluminium referred to in the above paragraph and especially at any of both the preferred molar ratios of calcium to aluminium and the preferred molar ratios of amino acid to aluminium referred to in the above paragraph, it is preferred that the antiperspirant active comprises an aluminium sesquichlorohydrate salt of formula $Al_2OH_{4.4}Cl_{1.6}$ to $Al_2OH_{4.9}Cl_{1.1}$ and more preferably of formula $Al_2OH_{4.7}Cl_{1.3}$ to $Al_2OH_{4.9}Cl_{1.1}$. Such actives are particularly suited to use in the compositions of the present invention.

Typically, the composition comprises antiperspirant active in an amount from 0.1 to 40%, more preferably from 1 to 30%, most preferably from 5 to 20% by total weight of the antiperspirant composition and including all ranges subsumed therein.

Typically, the antiperspirant active is dissolved in the water present in the composition giving an aqueous solution of the antiperspirant active.

It is also possible to deliver long lasting perfume impact by way of the present invention by incorporating a perfumery molecule i.e. a fragrance component in the cosmetic composition of the present invention. A perfumery molecule or a group of perfumery molecules formulated as a perfume is generally incorporated in most personal care compositions. Any perfumery molecule which is cosmetically acceptable may be included in the composition of the invention. Fragrance components and mixtures thereof may be obtained from natural products such as essential oils, absolutes, resinoids, resins and concretes, as well as synthetic products such as hydrocarbons, alcohols, aldehydes, ketones, ethers, carboxylic acids, esters, acetals, ketals, nitriles and the like, including saturated and unsaturated compounds, aliphatic, carbocyclic and heterocyclic compounds.

As per the present invention the perfumery molecule is preferably selected from a compound having an aldehyde, an alcohol, or an ester functional group or a mixture thereof. Amounts of the fragrance may range from 0.0001 to 5%, usually from 0.001 to 1.5%, more usually from 0.5 to 0.8% by weight of the cosmetic composition.

Preferably the composition is substantially free of surfactants. Substantially free of, as used herein, means less than 1.5%, and preferably less than 1.0%, and more preferably less than 0.75% and more preferably still less than 0.5%, and even more preferably less than 0.1% and most preferably from 0.0 to 0.01% by weight, based on total weight of the cosmetic composition, including all ranges subsumed therein.

The composition of the present invention can comprise a wide range of other optional components. The CTFA Personal care Ingredient Handbook, Second Edition, 1992, which is incorporated by reference herein in its entirety, describes a wide variety of non-limiting personal care and pharmaceutical ingredients commonly used in the skin care industry, which are suitable for use in the compositions of the present invention. Examples include: antioxidants, binders, biological additives, buffering agents, colorants,

thickeners, polymers, astringents, fragrance, conditioners, exfoliating agents, pH adjusters, preservatives, natural extracts, essential oils, skin sensates, skin soothing agents, and skin healing agents.

The cosmetic compositions of the present invention when comprising anti-perspirant actives are particularly suitable for dispensing from cosmetic roll-on dispensers that involve a container with a roll-on ball on a dispensing end.

The cosmetic composition of the invention preferably has a viscosity at 25 °C of from 1000 to 200000 cps, preferably 3000 to 60000 cps. The above viscosity is as measured using the following procedure.

DV-II+ PRO Digital Viscometer (from Brookfield Ltd) was used to measure the viscosities of the samples at a consistent shear rate of 10 rpm. The values were measured after one minute at a temperature of 25 °C were used.

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The invention further provides for a method for lightening skin comprising the step of topically applying to the skin the composition of the invention. The skin surface may thereafter be rinsed with water 10 minutes to 24 hours after the step of applying the composition.

The invention will now be demonstrated with the help of the following non-limiting examples.

Examples

The following conventional antiperspirant base composition (BASE 1) was prepared.

Ingredients	Chemical name/ details	Wt%
Pricerine 9091	Glycerol	4.00
Brij 78	Steareth 20	0.60
ASCH R301	40% solution of aluminium sesquichlorohydrate	27.50
Calcium chloride dihydrate	Calcium chloride dihydrate	1.10
Glycine	Glycine	1.84
Helianthus annus seed oil	Sunflower seed oil	4.00
Brij 72	Steareth 2	2.60
White willow	Fragrance	1.00
Iso propyl myristate	Iso propyl myristate	1.00
Water	Water	To 100

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The following antiperspirant base composition as per the invention (BASE 2) was prepared

Ingredients, wt%	Chemical name /details	Wt%
HDK H30	Hydrophobic silica (from Wacker)	0.50
Dow Corning 8500	Amino silicone	0.58
Xiameter PMX-0245	Cyclopentasiloxane	17.10
ASCH R301	40% solution of aluminium sesquichlorohydrate	27.50
Calcium chloride dihydrate	Calcium chloride dehydrate	1.10
Glycine	Glycine	1.84
Helianthus annus seed oil	Sunflower seed oil	4.00
Pricerine 9091	Glycerol	4.00
White willow	Fragrance	1.00
Water	Water	To 100

Example A-D, 1:

Various compositions were preparing using either BASE 1 or BASE 2 as shown in table 1 below. The compositions were tested for lightening using the following protocol.

20 milligram of the sample was applied on to a 9 cm^2 circular area of bio-skin (50#BSP from Beaulax Co. Ltd) evenly. The samples was left to dry at 25 °C for 24 hours. The samples were then washed for 30 seconds using a washing machine (Model M235 from Martindale SDL ATLAS) at 59.4 rpm for 30 circles with 0.2 gram of a facial cleanser. The sample was then allowed to dry at 25 °C for 15 minutes after which the colour was measured using a Digi eye test. L* value was measured after it was completely dry. ΔL was obtained from $(L_{sample} - L_{blank})$. L_{sample} is the L values of 50#BSP with the composition after the above wash protocol while L_{blank} is the L value of a blank 50#BSP. The ΔL value for each of the compositions is also given in the Table 1 below.

Table 1

Ingredients	A	B	C	D	1
MT700Z, wt%	1.00	1.00	1.00	0.00	1.00
MQ1640, wt%	0.00	3.00	0.00	3.00	3.00
BASE	BASE 1	BASE 1	BASE 2	BASE 2	BASE 2
BASE, wt%	To 100	To 100	To 100	To 100	To 100
ΔL	0.23	0.11	0.81	0.35	3.86

MT700Z is titanium dioxide of average particle size 80 nm from Tayca.

MQ1640 is a film forming polymer of the silicone resin class sourced from Dow Corning.

The data in Table 1 indicates that skin lightening obtained from a conventional anti-perspirant base does not provide the necessary skin lightening efficacy on inclusion of optical particle and film forming polymer (Examples A & B). On the other hand, the base as per the invention (BASE 2) provides synergistic skin lightening efficacy when optical particle and film forming polymer are included (Example 1) as compared to the data when only optical particle (Example C) or only film forming polymer is included (Example D).

Example E, 2

Compositions using a different film forming polymer as shown in Table 2 below were prepared and the ΔL values obtained are summarized therein. The procedure used was the same as for the previous examples.

Table 2

Ingredients	E	2
MT700Z, wt%	1.00	1.00
PIB, wt%	3.00	3.00
BASE	BASE 1	BASE 2
BASE, wt%	To 100	To 100
ΔL	0.12	1.16

PIB is a film forming polymer of the Cosmetic class sourced from Evonik.

The data in table 2 above, proves that other film forming polymers may also be used in the base composition of the invention (Example 2) to obtain the skin lightening benefit while this benefit is not obtained when a conventional base is used (Example E).

Example F,G, 3, 4

Compositions using different optical particles as shown in Table 3 below were prepared and the ΔL values obtained are summarized therein. The procedure used was the same as for the previous examples.

Table 3

Ingredients	F	3	G	4
ZnO, wt%	1.00	1.00	0.00	0.00
Mica, wt%	0.00	0.00	1.00	1.00
MQ1640, wt%	3.00	3.00	3.00	3.00
BASE	BASE 1	BASE 2	BASE 1	BASE 2
BASE, wt%	To 100	To 100	To 100	To 100
ΔL	0.48	2.06	0.75	2.24

The data in Table 3 above indicates that various other types of optical particles (zinc oxide and mica) can be used in the composition of the invention (Examples 3, 4) to get the enhanced benefit while this is not observed when a conventional composition is used.

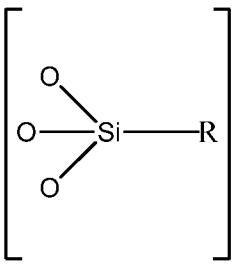
Claims

1. A cosmetic composition comprising an emulsion comprising
   (i) hydrophobically modified silica;
   (ii) amino functionalized silicone; and
   (iii) water;
   the cosmetic composition further comprising
   (iv) an optical particle; and
   (v) a film forming polymer selected from an acrylate polymer, a methacrylate polymer, a urethane polymer, aliphatic polyurethane resin, silicone resin, polyquaternium or co-polymers thereof.
   wherein the pH of the composition at 25°C is from 2 to 6.

2. A composition as claimed in claim 1 wherein the pH of the composition is from 2 to 4.

3. A composition as claimed in claim 1 additionally comprising an antiperspirant skin care active selected from aluminium chlorohydrate, aluminum-zirconium tetrachlorohydrex glycine complex, aluminum-zirconium octachlorohydrex glycine complex, aluminum-zirconium pentachlorohydrate, aluminum sesquichlorohydrate or mixtures thereof.

4. A composition as claimed in any one of the preceding claims wherein the hydrophobically modified silica comprises



   wherein R is a C_4 to C_{18} alkyl group, more preferably a C_8H_{17} alkyl group.

5. A composition as claimed in any one of the preceding claims wherein the hydrophobically modified silica has a primary particle size from 1 nm to 100 nm.

6. A composition as claimed in any one of the preceding claims wherein the hydrophobically modified silica is present in 0.05 to 20% by weight of the total composition.

7. A composition as claimed in any one of the preceding claims wherein the amino-functionalised silicone is amodimethicone.

8. A composition as claimed in any one of the preceding claims comprising amino functionalized silicone from 0.01 to 25% by weight of the total composition.

9. A composition as claimed in any one of the preceding claims wherein the optical particle is a bead or an inorganic particle with a refractive index higher than 1.8.

10. A composition as claimed in claim 9 wherein the inorganic particle is titanium dioxide, zinc oxide, boron nitride, iron oxide, mica, mica coated with titanium dioxide or mixtures thereof.

11. A composition as claimed in claim 10 wherein said inorganic particle is titanium dioxide.

12. A composition as claimed in claim 11 wherein the titanium dioxide has a particle size from 15 nm to 30 micron.

13. A composition as claimed in any one of the preceding claims wherein the film forming polymer is an acrylate co-polymer, a silicone resin or a urethane-acrylic co-polymer.

14. A composition as claimed in any one of the preceding claims where in the film forming polymer is present in 0.5 to 10% by weight of the composition.

15. A method of lightening skin comprising the step of topically applying to the skin the composition as claimed in any one of the preceding claims.

INTERNATIONAL SEARCH REPORT

International application No
PCT/EP2017/059091

A. CLASSIFICATION OF SUBJECT MATTER
INV. A61K8/25 A61K8/29 A61Q15/00 A61Q19/02 A61K8/898
A61K8/02 A61K8/06
ADD.
According to International Patent Classification (IPC) or to both national classification and IPC

B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)
A61K A61Q

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

Electronic data base consulted during the international search (name of data base and, where practicable, search terms used)
EPO-Internal, BIOSIS, CHEM ABS Data, EMBASE, WPI Data

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	WO 2013/064367 A1 (UNILEVER NV [NL]; UNILEVER PLC [GB]; UNILEVER HINDUSTAN [IN]; CONOPCO) 10 May 2013 (2013-05-10) cited in the application examples 6-9	1-15
X	WO 2011/056623 A1 (AVON PROD INC [US]; GARRISON MARK S [US]; ROBINSON FREDA E [US]; SANDS) 12 May 2011 (2011-05-12) paragraph [0020] example 1B	1-15

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

☒ See patent family annex.

* Special categories of cited documents :

"A" document defining the general state of the art which is not considered to be of particular relevance

"E" earlier application or patent but published on or after the international filing date

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"O" document referring to an oral disclosure, use, exhibition or other means

"P" document published prior to the international filing date but later than the priority date claimed

"T" later document published after the international filing date or priority date and not in conflict with the application but cited to understand the principle or theory underlying the invention

"X" document of particular relevance; the claimed invention cannot be considered novel or cannot be considered to involve an inventive step when the document is taken alone

"Y" document of particular relevance; the claimed invention cannot be considered to involve an inventive step when the document is combined with one or more other such documents, such combination being obvious to a person skilled in the art

"&" document member of the same patent family

Date of the actual completion of the international search	Date of mailing of the international search report
17 May 2017	30/05/2017

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INTERNATIONAL SEARCH REPORT

Information on patent family members

International application No
PCT/EP2017/059091

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