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ANHYDROUS, ANTIPERSPIRANT COMPOSITION HAVING IMPROVED STABILITY

TECHNICAL FIELD

[0001] The present disclosure relates to substantially anhydrous, antiperspirant compositions which have improved stability with respect to the suspensions of the antiperspirant active substances used in oil, a non-therapeutic method for reducing and/or regulating perspiration and/or body odor, and the use of certain types of starch and minerals to improve the stability of suspensions of antiperspirant active substances.

BACKGROUND

[0002] Commercially available antiperspirant compositions, also referred to below as antiperspirants, contain at least one water-soluble astringent inorganic or organic salt of aluminum as an antiperspirant active substance. The antiperspirant active substances have no direct influence on the activity of the sweat glands, but rather minimize sweat secretion by narrowing the outflow channels. The Al salts in this case cause sweat inhibition on the treated skin surfaces through superficial blockage of the sweat gland ducts as a result of Al-mucopolysaccharide precipitation. Antiperspirant compositions are usually applied in the armpit area.

[0003] Antiperspirant compositions are available in a variety of dosage forms, for example, as a sprayable composition having a propellant. Such compositions are usually filled in spray cans of aluminum or (more rarely) tinplate, which are protected against corrosion by an interior coating. Corrosion damage may occur, however, despite such a protective coating. A further problem with such products is that the valve clogs. A corrosion inhibiting and/or valve clogging reducing composition would therefore be desirable for these special dosage forms.

[0004] Sprayable compositions having propellant are usually based on suspensions of astringent salts such as aluminum chlorohydrate (ACH) in non-polar oils such as cyclomethicones. These suspensions must be stable for as long as possible. When the salt particles sediment before or during filling, deviations in the composition occur. When the salt particles sediment after filling, the effect may be that when the spray can is insufficiently

shaken for a time, the antiperspirant composition sprayed by the consumer is uneven and has a poor antiperspirant effect. For formulations with unmilled and therefore spherical ACH particles, this poses a particular challenge because the round particles sediment more easily than the milled particles having an irregular surface.

[0005] There is therefore a continuing need for antiperspirant compositions which remain stable for a long time and do not sediment.

BRIEF SUMMARY

[0006] In a first aspect, the present disclosure relates to an antiperspirant composition for personal body care comprising:

a) at least one antiperspirant active substance present in the form of spherical particles, in suspended, undissolved form, and selected from aluminum salts in b) a total amount of about 5-40% by weight,

b) about 0.1-10% by weight of rice starch,

c) about 0.1-10% by weight of hydrophobically modified clay mineral,

d) at least one oil in a total amount of about 20-94.8% by weight,

wherein all weight % specifications are based on the weight of the composition, without taking into account the weight of any propellants that are present.

[0007] Preferably, the at least one antiperspirant active substance (a) is aluminum chlorohydrate.

[0008] Preferably, the composition comprises the at least one antiperspirant active substance (a) in a total amount of from about 10-35% by weight, more preferably from about 15-28% by weight, and more preferably still from about 23-27% by weight,

[0009] Preferably, the composition comprises about 0.4-2% by weight of rice starch.

[0010] Preferably, the composition comprises about 1.5-3.5% by weight of hydrophobically modified clay mineral.

[0011] Preferably, the composition comprises the at least one oil in a total amount of about 40-85% by weight, preferably about 50-80% by weight, and more preferably about 60-75% by weight.

[0012] The rice starch may be present as a powder treated with cationic surfactants, wherein the fraction of cationic surfactants is about 0.01-0.3% by weight, based on the weight of the rice starch.

[0013] The hydrophobically modified clay mineral may be selected from hydrophobically modified hectorites, hydrophobically modified bentonites and hydrophobically modified montmorillonites. Preferably, the hydrophobically modified clay mineral is selected from disteardimonium hectorite, stearalkonium hectorite, quaternium-18 hectorite and quaternium-18 bentonite.

[0014] Preferably, 70-95% by weight of the spherical particles of the at least one antiperspirant active substance have a size above 10 μm, 80-100% by weight of the spherical particles have a size of up to 75 μm, and 90-100% by weight of the spherical particles have a size up to 125 μm, each based on the weight of the antiperspirant active substance.

[0015] The at least one oil may be mixture of at least two oils comprising at least one volatile silicone oil in a total amount of about 10 to 40% by weight, preferably about 15 to 35% by weight, and more prefearbly about 20 to 30% by weight, and at least one non-volatile oil in a total amount of about 10 to 50% by weight, preferably about 20 to 45% by weight, and more preferably about 25 to 40% by weight, and optionally at least one non-volatile silicone oil in a total amount of about 0-20% by weight, preferably about 3-15% by weight, and more preferably about 6-13% by weight.

[0016] Preferably, the at least one volatile silicone oil is selected from octamethylcyclotetrasiloxane, decamethylcyclopentasiloxane, dodecamethylcyclohexasiloxane, hexamethyldisiloxane, octamethyltrisiloxane and decamethyltetrasiloxane, and mixtures thereof, more preferably is selected from

decamethylcyclopentasiloxane, mixtures of decamethylcyclopentasiloxane and dodecamethylcyclohexasiloxane, and mixtures of hexamethyldisiloxane, octamethyltrisiloxane and decamethyltetrasiloxane, and most preferably the at least one volatile silicone oil is or comprises decamethylcyclopentasiloxane.

[0017] Preferably, the at least one non-volatile oil is selected from isopropyl myristate, isopropyl palmitate, isopropyl stearate, 2-ethylhexyl palmitate, 2-ethylhexyl stearate and triethyl citrate and mixtures of the aforementioned esters.

[0018] Preferably, the at least one nonvolatile silicone oil is or comprises polydimethylsiloxane having a viscosity of 5 cSt.

[0019] The at least one antiperspirant active substance (a) is preferably present in a total amount of 5-40% by weight, based on the total weight of the propellant-free composition.

[0020] The composition may further comprise at least one perfume in a total amount of 0.1-15% by weight, based on the total weight of the propellant-free composition.

[0021] In a second aspect, the present disclosure relates to a non-therapeutic, cosmetic method for reducing and/or regulating perspiration and/or body odor, comprising applying an effective amount of a composition as described supra to the skin, preferably the skin of the underarm region.

[0022] In a third aspect, the present disclosure relates to the use of rice starch and a hydrophobically modified clay mineral in suspensions of antiperspirant active substances in the form of spherical particles suspended in oils in substantially anhydrous antiperspirant compositions, preferably antiperspirant compositions as described supra, for improving the stability of the suspension.

[0023] In a fourth aspect, the present disclosure relates to a sprayable antiperspirant comprising a composition as described supra, wherein the composition is contained in an aerosol can with a compressed gaseous propellant.

DETAILED DESCRIPTION

[0024] The following detailed description is merely exemplary in nature and is not intended to limit the disclosure or the application and uses of the subject matter as described herein. Furthermore, there is no intention to be bound by any theory presented in the preceding background or the following detailed description.

[0025] An aim of the present disclosure was to provide antiperspirant compositions which form as stable as possible suspensions of powdery antiperspirant active substances, in particular aluminum chlorohydrate, in non-polar oils.

[0026] Surprisingly, it has been found that this may be achieved by antiperspirant active substances, in particular aluminum chlorohydrate, in the form of spherical particles in combination with rice starch and hydrophobically modified clay minerals, while no such pronounced stabilization is achieved with other types of starch.

[0027] A subject of the present disclosure is therefore a substantially anhydrous, antiperspirant composition for personal body care comprising

a) at least one antiperspirant active substance present in the form of spherical particles, in suspended, undissolved form, and selected from aluminum salts, in particular aluminum chlorohydrate, in a total amount of from about 5 to about 40% by weight, preferably from about 10 to about 35% by weight, especially preferably from about 15 to about 28% by weight, most preferably from about 23 to about 27% by weight,

b) from about 0.1 to about 10% by weight, preferably from about 0.4 to about 2% by weight of rice starch,

c) from about 0.1 to about 10% by weight, preferably from about 1.5 to about 3.5% by weight of hydrophobically modified clay mineral,

d) at least one oil in a total amount of from about 20 to about 94.8% by weight, preferably from about 40 to about 85% by weight, more preferably from about 50 to about 80% by weight, most preferably from about 60 to about 75% by weight,

wherein all weight % specifications are based on the weight of the composition, without taking into account any propellants which may be present.

[0028] "Normal conditions" in the context of the present application are a temperature of 20°C and a pressure of about 1013.25 mbar. Melting point specifications also refer to a pressure of about 1013.25 mbar. As used herein, the term “about” when used in conjunction with a numerical value should be construed as encompassing the specified numerical value, and allows for minor deviations therefrom. For example, the term “from about 5 to about 40% by wieight” axiomatically includes the range from 5 to 40 % by weight, and extends to values near the extremities of the range.

[0029] Unless stated otherwise, all amount specifications are based on the total weight of the antiperspirant composition as contemplated herein. Any added propellants are not included in the antiperspirant composition of the present disclosure, therefore, all amount specifications are based on the total weight of the propellant-free antiperspirant composition, unless otherwise specified.

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[0030] "Substantially anhydrous" means, as contemplated herein, a content of free water of not more than 7% by weight, based on the total composition.

[0031] "Free water" in the context of the present application is water that is not present in the form of water of crystallization, water of hydration or similar molecularly bound water in the antiperspirant composition. The content of water of crystallization, water of hydration or similar molecularly bound water which is present in the constituents used, in particular in the antiperspirant active substances, does not constitute free water in the context of the present application. Free water is, for example, water which is added to the composition as contemplated herein as a solvent, as a gel activator or as a solvent constituent of other active substances.

[0032] The antiperspirant compositions as contemplated herein comprise, based on their total weight, 0 to about 7% by weight free water. As contemplated herein, preferred antiperspirant compositions contain, based on their total weight, 0 to about 6% by weight of free water, preferably 0 to about 5% by weight, particularly preferably 0 to about 4% by

weight, most preferably 0 to about 3% by weight of free water. The antiperspirant compositions as contemplated herein are thus to be regarded as substantially anhydrous.

[0033] The compositions as contemplated herein comprise, based in each case on their weight, from about 0.1 to about 10% by weight, preferably from about 0.4 to about 2% by weight, of rice starch.

[0034] The rice starch used as contemplated herein is obtained from rice. In preferred compositions as contemplated herein, the rice starch comprises from about 10 to about 40% by weight, preferably from about 20 to about 30% by weight, particularly preferably from about 22 to about 28% by weight of amylose and from about 60 to about 90% by weight, preferably from about 70 to about 80% by weight, more preferably from about 72 to about 78% by weight of amylopectin, based on the weight of the rice starch.

[0035] Compositions as contemplated herein comprise rice starch in a total amount of from about 0.1 to about 5% by weight, preferably from about 0.2 to about 2% by weight, particularly preferably from about 0.4 to about 1% by weight, based on the weight of the composition, preferably as a powder treated with cationic surfactant, more preferably with a fraction of the cationic surfactant content of from about 0.01 to about 3% by weight, most preferably from about 0.1 to about 0.15% by weight, based on the weight of the rice starch.

[0036] Preferred cationic surfactants are alkyltrimethylammonium chlorides, more preferably C_{12}-C_{22} alkyltrimethylammonium chlorides, preferably C_{16} alkyltrimethylammonium chloride (cetrimonium chloride).

[0037] The compositions as contemplated herein comprise at least one hydrophobically modified clay mineral. Preferred hydrophobically modified clay minerals are selected from hydrophobically modified montmorillonites, hydrophobically modified hectorites and hydrophobically modified bentonites, more preferably disteardimonium hectorites, stearalkonium hectorites, quaternium-18 hectorites and quaternium-18 bentonites. Preferred compositions as contemplated herein comprise at least one hydrophobically modified clay mineral in a total amount of from about 0.1 to about 10% by weight, preferably from about 1

to about 7% by weight, particularly preferably from about 1.5 to about 6% by weight, very preferably from about 1.5 to about 3.5% by weight, each based on the total weight of the propellant-free composition as contemplated herein.

[0038] Hydrophobically modified clay minerals are understood to mean clay minerals whose naturally occurring metal cations are wholly or partially replaced by cations substituted with hydrophobic groups, preferably ammonium cations substituted by long-chain alkyl groups, wherein the long-chain alkyl groups contain preferably 5-30, more preferably 7-25, most preferably 10-20 carbon atoms.

[0039] The compositions as contemplated herein comprise at least one antiperspirant active substance that is selected from aluminum salts. Preferred antiperspirant active substances are selected from the water-soluble astringent inorganic and organic salts of aluminum.

[0040] As contemplated herein, water solubility is understood to mean a solubility of at least 3% by weight at 20°C, that is, amounts of at least 3 g of the antiperspirant active substance are soluble in 97 g of water at 20°C. As contemplated herein, water solubility is understood to mean a solubility of at least 5% by weight at 20°C, that is, amounts of at least 5 g of the antiperspirant active substance are soluble in 95 g of water at 20°C.

[0041] Particularly preferred antiperspirant active substances are selected from aluminum chlorohydrate, in particular aluminum chlorohydrate having the general formula $[Al_2(OH)_5Cl \cdot 1\text{-}6\ H_2O]_n$, preferably $[Al_2(OH)_5Cl \cdot 2\text{-}3\ H_2O]_n$, which can be present in non-activated or in activated (depolymerized) form, and aluminum chlorohydrate having the general formula $[Al_2(OH)_4Cl_2 \cdot 1\text{-}6\ H_2O]_n$, preferably $[Al_2(OH)_4Cl_2\ \ 2\text{-}3\ H_2O]_n$, which may be in non-activated or in activated (depolymerized) form.

[0042] In the compositions as contemplated herein, the antiperspirant active substance, preferably aluminum chlorohydrate, is present in the form of spherical particles. The term "spherical particles" is understood to mean particles which are ellipsoidal, preferably ellipsoidal, with at least two axes of substantially the same length, preferably of the same

length, and which are extremely preferably spherical. The axial lengths of an ellipsoidal particle preferably differ by at most 30%, preferably by at most 20%, more preferably by at most 10%, most preferably by at most 3% from each other, based on the length of the longest axis.

[0043] "Ellipsoid-shaped" and "spherical" mean that the particles appear as ellipsoids or spheres when viewed under a microscope at about a thousand times magnification. Ellipsoidal or spherical does not necessarily mean that the particles have a perfectly smooth surface.

[0044] In compositions as contemplated herein, preferably from about 70 to about 95% by weight of the particles have a size of more than 10 μm, from about 80 to about 100% by weight of the particles have a size of up to 75 μm and from about 90 to about 100% by weight of the particles have a size of up to 125 μm, and most preferably from about 75 to about 80% by weight of the particles have a size greater than 10 μm, from about 90 to about 100% by weight of the particles have a size of up to 75 μm and from about 99 to about 100% by weight of the particles have a size of up to 125 μm, in each case on the weight of the antiperspirant active substance. “Size" is understood to mean the diameter in the case of spherical particles and the length of at least two axes in the case of ellipsoidal particles. As contemplated herein, the spherical particles are preferably unmilled.

[0045] Also preferred are aluminum sesquichlorohydrate, aluminum dichlorohydrate, aluminum chlorohydrex-propylene glycol (PG) or aluminum chlorohydrex-polyethylene glycol (PEG), aluminum sesquichlorohydrex PG or aluminum sesquichlorohydrex PEG, aluminum PG-dichlorhydrex or aluminum PEG-dichlorhydrex, aluminum hydroxide, potassium aluminum sulfate ($KAl(SO_4)_2$ 12 H_2O, alum), dehydrated alum ($KAl(SO_4)_2$ with zero to 11 moles of water of crystallization), sodium aluminum chlorhydroxactate, aluminum bromohydrate, aluminum chloride, aluminum sulfate, aluminum lactate, sodium aluminum chlorohydroxylactate. Particularly preferred antiperspirant active substances as contemplated herein are selected from so-called "activated" aluminum salts, which are also referred to as "antiperspirant active substances" with “enhanced activity”. Such active substances are known in the art and are also commercially available. Activated aluminum salts are usually

produced by heat treating a relatively dilute solution of the salt (for example, about 10% by weight of salt) to increase its HPLC peak 4topeak 3 area ratio. The activated salt can then be dried to a powder, in particular spray-dried. In addition to spray drying, for example, drum drying is also suitable.

[0046] Activated aluminum salts typically have an HPLC peak 4-to-peak 3 area ratio of at least 0.4, preferably at least 0.7, more preferably at least 0.9, wherein at least 70% of the aluminum is attributed to these peaks.

[0047] Further preferred antiperspirant active substances are basic calcium aluminum salts. These salts are prepared by reacting calcium carbonate with aluminum chlorhydroxide or aluminum chloride and aluminum powder or by adding calcium chloride dihydrate to aluminum chlorhydroxide.

[0048] Further preferred activated aluminum salts are those of the general formula $Al_2(OH)_{6-a}Xa$, wherein X is Cl, Br, I or NO_3 and "a" is a value of 0.3 to 5, preferably from 0.8 to 2.5 and particularly preferably 1 to 2, so that the molar ratio of Al:X is 0.9:1 to 2.1:1, as disclosed, for example, in US 6074632. In general, some water of hydration is associatively bound to these salts, typically 1 to 6 moles of water per mole of salt. Particularly preferred is aluminum chlorohydrate (that is, X is Cl in the aforementioned formula) and especially 5/6 basic aluminum chlorohydrate wherein "a" is 1 so that the molar ratio of aluminum to chlorine is 1.9:1 to 2.1:1. Zirconium-free aluminum sesquichlorohydrates particularly preferred as contemplated herein have a molar metal-to-chloride ratio of 1.5:1 - 1.8:1.

[0049] Particularly preferred compositions as contemplated herein comprise the at least one antiperspirant active substance in a total amount of from about 5 to about 40% by weight, preferably 10-35% by weight, more preferably from about 15 to about 28% by weight and most preferably from about 23 to about 27% by weight, based on the total weight of the composition, without taking into account possibly existing propellant.

[0050] As further ingredients, the compositions as contemplated herein may comprise at least one oil which is liquid under normal conditions, which oil is preferably a carrier fluid or

a suspension medium for the at least one antiperspirant active substance. In the case of cosmetic oils, a distinction is made between volatile and non-volatile oils. Non-volatile oils are understood to mean oils which have a vapor pressure of less than 2.66 Pa (0.02 mm Hg) at 20°C and an ambient pressure of 1013 hPa. Volatile oils are understood to mean those oils which, at 20°C and an ambient pressure of 1013 hPa, have a vapor pressure of 2.66 Pa - 40,000 Pa (0.02 mm-300 mm Hg), preferably 12-12,000 Pa (0.1-90 mm Hg), more preferably 13-8,000 Pa, exceptionally preferably 30-3,000 Pa, further preferably 100-400 Pa. The at least one oil is preferably selected from volatile or nonvolatile silicone oils; esters of linear or branched saturated or unsaturated fatty alcohols having from 2-30 carbon atoms with linear or branched saturated or unsaturated fatty acids having from 2-30 carbon atoms which may be hydroxylated; dicarboxylic acid esters of linear or branched C_2-C_{10} alkanols; benzoic acid esters of linear or branched C_{8-22} alkanols; mono- and polyesters of lactic acid, citric acid, tartaric acid or adipic acid with a monohydric alcohol having 2 to 9 carbon atoms; mono- and polyesters of lactic acid, citric acid, tartaric acid or adipic acid with a di-, tri- or tetravalent alcohol having 2 to 9 carbon atoms; symmetric, unsymmetrical or cyclic esters of carbonic acid with fatty alcohols; C_8-C_{30} isoparaffins; and branched saturated or unsaturated fatty alcohols having 6-30 carbon atoms.

[0051] The at least one oil may be present in a total amount of from about 20 to about 94.8% by weight, preferably from about 40 to about 85% by weight, more preferably from about 50 to about 80% by weight, most preferably from about 60 to about 75% by weight in the composition, based on the weight of the composition, without taking into account possibly existing propellant. Preferred volatile silicone oils are selected from dialkyl and alkylaryl siloxanes which have a vapor pressure of less than 2.66 Pa (0.02 mm Hg) at 20°C and an ambient pressure of 1013 hPa, such as octamethylcyclotetrasiloxane, decamethylcyclopentasiloxane, dodecamethylcyclohexasiloxane, dimethylpolysiloxane, low molecular weight phenyl trimethicone and methylphenylpolysiloxane, but also hexamethyldisiloxane, octamethyltrisiloxane and decamethyltetrasiloxane. Particular preference is given to volatile silicone oils which are cyclic, such as octamethylcyclotetrasiloxane, decamethylcyclopentasiloxane and dodecamethylcyclohexasiloxane and mixtures thereof, as described, for example, in the

commercial products DC 244, 245, 344 and 345 from Dow Corning (vapor pressure about 13-15 Pa at 20°C), decamethylcyclopentasiloxane is exceptionally preferred.

[0052] Likewise, particularly preferred are volatile linear silicone oils having 2-10 siloxane units, in particular hexamethyldisiloxane (L_2), octamethyltrisiloxane (L_3), decamethyltetrasiloxane (L_4) and any mixtures of two and three of L_2, L_3 and/or L_4, preferably such mixtures as present, for example, in the commercial products DC 2-1184, Dow Corning® 200 (0.65 cSt) and Dow Corning® 200 (1.5 cSt) from Dow Corning. A further preferred volatile silicone oil is a low molecular weight phenyl trimethicone having a vapor pressure of about 2000 Pa at 20°C as available, for example, from GE Bayer Silicones / Momentive under the name Baysilone Fluid PD 5.

[0053] Volatile silicone oils are particularly suitable carrier oils for antiperspirant compositions as contemplated herein, since they give them a pleasant feeling on the skin and little textile soiling.

[0054] Preferred nonvolatile silicone oils are selected from linear polydimethylsiloxanes having kinematic viscosities (25°C) in the range from 5-350 cSt, preferably 5-100 cSt or also 10-50 cSt.

[0055] Preferred esters of linear or branched saturated or unsaturated fatty alcohols having 2-30 carbon atoms with linear or branched saturated or unsaturated fatty acids having 2-30 carbon atoms, which may be hydroxylated, are preferably selected from isopropyl palmitate, isopropyl stearate, isopropyl myristate, 2-ethylhexyl palmitate, 2-ethylhexyl stearate, 2-hexyldecyl stearate, 2-hexyldecyl laurate, isononyl isononanoate, isooctyl stearate, isononyl stearate, isocetyl stearate, isononyl isononanoate, isotridecyl isononanoate, cetearyl isononanoate, 2-ethylhexyl laurate, 2-ethylhexyl isostearate, 2-ethylhexyl cocoate, 2-octyldodecyl palmitate, butyloctanoic acid 2-butyloctanoate, diisotridecylacetate, n-hexyl laurate, n-decyl oleate, oleyl oleate, oleyl erucate, erucyl oleate and erucyl erucate and mixtures of the aforementioned esters, more preferably from isopropyl palmitate, isopropyl stearate, isopropyl myristate, 2-ethylhexyl palmitate and 2-ethylhexyl stearate.

Preferred dicarboxylic acid esters of linear or branched C_2-C_{10} alkanols are selected from diisopropyl adipate, di-n-butyl adipate, di-(2-ethylhexyl) adipate, dioctyl adipate, diethyl / di-n-butyl / dioctyl sebacate, diisopropyl sebacate, dioctyl malate, dioctyl maleate, dicaprylyl maleate, diisooctyl succinate, di-2-ethylhexyl succinate and di-(2-hexyldecyl) succinate and mixtures of the aforementioned esters.

[0056] Preferred benzoic acid esters of linear or branched C_{8-22} alkanols are selected from dodecyl benzoate, tridecyl benzoate, tetradecyl benzoate, pentadecyl benzoate, hexadecyl benzoate, octadecyl benzoate, 2-methylheptadecyl benzoate, octyl dodecyl benzoate. Particular preference is given to benzoic acid C12-C15 alkyl esters, for example, available as a commercial product Finsolv® TN, benzoic acid isostearyl ester, 2-ethylhexyl benzoate, and benzoic acid 2-octyldocecyl ester, wherein benzoic acid C12-C15 alkyl esters are highly preferred.

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[0057] Triethyl citrate is preferred among the mono- and polyesters of lactic acid, citric acid, tartaric acid or adipic acid with a monohydric alcohol having 2 to 9 carbon atoms. Triglyceride oils of linear or branched, saturated or unsaturated, optionally hydroxylated C_{8-30} fatty acids, in particular natural oils, e.g., soybean oil, cottonseed oil, sunflower oil, palm oil, palm kernel oil, linseed oil, almond oil, castor oil, corn oil, rapeseed oil, olive oil, sesame oil, thistle oil, wheat germ oil, peach kernel oil and the liquid fractions of coconut oil and the like, but also synthetic triglyceride oils, in particular capric/caprylic triglycerides, for example, the commercial products Myritol® 318 or Myritol® 331 (BASF) with unbranched fatty acid residues and glyceryl triisostearin with branched fatty acid residues, are in principle also suitable as additional oils, but due to their less favorable residue behavior, less preferred. Such triglyceride oils are preferably present in a total amount of 0 to 1% by weight, particularly preferably 0 to 0.5% by weight, in each case based on the weight of the composition, without taking into account possibly existing propellant.

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[0058] Preferred symmetrical, asymmetrical or cyclic esters of carbonic acid with fatty alcohols are selected from dicaprylyl carbonate (Cetiol® CC), di-n-octyl carbonate, di-n-dodecylcarbonat, di-(2-ethylhexyl) carbonate or the esters according to the teaching of DE 19756454 A.

[0059] Preferred C_8-C_{16} isoparaffins are selected from isodecane, isoundecane, isododecane, isotridecane, isotetradecane, isopentadecane, and isohexadecane, and mixtures thereof. Preference is given to C_{10}-C_{13} isoparaffin mixtures, in particular those having a vapor pressure at 20°C of about 10-400 Pa, preferably 13-300 Pa. Preferred C_{18} -C_{30} isoparaffins are selected from isoeicosane, polyisobutenes or polydecenes, which are available, for example, under the name Emery® 3004, 3006, 3010 or under the name Ethylflo® from Albemarle or Nexbase® 2004G from Nestle, and 1,3-di-(2-ethylhexyl) cyclohexane (available, for example, under the trade name Cetiol®S from BASF). Preferred branched saturated or unsaturated fatty alcohols having 6-30 carbon atoms are selected from 2-hexyl decanol, octyl dodecanol (Eutanol® G) and 2-ethylhexyl alcohol.

[0060] Particularly preferred compositions as contemplated herein comprise mixtures of at least two oils, wherein at least one of said oils is a volatile silicone oil, in a total amount of 10 to 40% by weight, preferably 15 to 35% by weight, particularly preferably 20 to 30% by weight, and wherein at least one of said oils is a non-volatile oil in a total amount of 10 to 50% by weight, preferably 20 to 45% by weight, particularly preferably 25 to 40% by weight and optionally a non-volatile silicone oil, preferably polydimethylsiloxane in a total amount of 0 to about 20% by weight, preferably from about 3 to about 15% by weight, particularly preferably from about 6 to about 13% by weight.

[0061] In compositions extraordinarily preferred as contemplated herein, the oil composition is a mixture of decamethylcyclopentasiloxane as a volatile silicone oil, isopropyl myristate as a non-volatile oil, polydimethylsiloxane having a viscosity of 5 cSt as a non-volatile silicone oil and additionally ethylhexyl palmitate, in each case based on the weight of the composition, without taking into account possibly existing propellant.

[0062] Fragrances and scents as contemplated herein do not belong to the oils d).

[0063] The definition of a fragrance in the context of the present application corresponds to the general expert definition as it can be found in the RÖMPP Chemie Lexikon, version of December 2007. Accordingly, a fragrance is a chemical compound having odor and/or taste

that excites the receptors of the hair cell of the olfactory system (adequate stimulus). The necessary physical and chemical properties for this are a low molecular weight of at most 300 g/mol, a high vapor pressure, minimal water and high lipid solubility and weak polarity and the presence of at least one osmophoric group in the molecule. In order to distinguish volatile, low molecular weight substances, which, usually and in the context of the present disclosure, are not regarded and used as a fragrance but rather primarily as a solvent, such as, for example, ethanol, propanol, isopropanol and acetone, from fragrances as contemplated herein, fragrances as contemplated herein have a molecular weight of 74 to 300 g/mol, contain at least one osmophoric group in the molecule and have an odor and/or taste, that is, they excite the receptors of the hair cells of the olfactory system. Examples of scent and fragrance compounds of the ester type are benzyl acetate, phenoxyethyl isobutyrate, p-tert-butylcyclohexyl acetate, linalyl acetate, dimethylbenzylcarbinylacetate (DMBCA), phenylethylacetate, benzylacetate, ethylmethylphenylglycinate, allylcyclohexylpropionate, styrallylpropionate, benzylsalicylate, cyclohexylsalicylate, floramate, melusate and jasmecyclate. Examples of scent and fragrance compounds of the ether type are benzyl ethyl ether and ambroxane, examples of scent and fragrance compounds of the aldehyde type are the linear alkanals having 8-18 carbon atoms, citral, citronellal, citronellyloxy-acetaldehyde, cyclamen aldehyde, lilial and bourgeonal, examples of scent and fragrance compounds of the ketone type are the ionones, alpha-isomethyl-ionone and methyl cedryl ketone, examples of scent and fragrance compounds of the alcohol type are anethole, citronellol, eugenol, geraniol, linalool, phenylethyl alcohol and terpineol, examples of scent and fragrance compounds of the terpene type are limonene and pinene. Examples of scent and fragrance compounds are pine, citrus, jasmine, patchouly, rose, ylang-ylang, muscatel sage oil, chamomile, clove oil, mint oil, cinnamon oil, lime blossom oil, juniper berry oil, vetiver oil, olibanum oil, galbanum oil, labdanum oil, orange blossom oil, neroli oil, orange peel oil and sandalwood oil, further the essential oils such as angelica root oil, aniseed oil, arnica blossom oil, basil oil, bay oil, bergamot oil, champacilla oil, silver fir oil, silver fir cone oil, elemi oil, eucalyptus oil, fennel oil, spruce needle oil, geranium oil, ginger grass oil, guaiac wood oil, gurdyal balm oil, helichrysum oil, ho oil, ginger oil, iris oil, cajeput oil, calamus oil, chamomile oil, camphor oil, kanga oil, cardamom oil, cassia oil, pine needle oil, copaiba balsam oil, coriander oil, spearmint oil, caraway oil, cumin oil, lavender oil, lemon grass oil, lime oil, tangerine oil, lemon balm oil, musk kernel oil, myrrh oil, clove oil, niaouli oil, orange oil,

oregano oil, palmarosa oil, patchouli oil, Peru balsam oil, petit grain oil, pepper oil, peppermint oil, allspice oil, pine oil, rose oil, rosemary oil, sandalwood oil, celery oil, spik oil, star anise oil, turpentine oil, thuja oil, thyme oil, verbena oil, juniper berry oil, wormwood oil, wintergreen oil, hyssop oil, cinnamon oil, citronella oil, lemon oil and cypress oil. Further scent and fragrance compounds are ambrettolide, alpha-amylcinnamaldehyde, anethole, anisaldehyde, anisalcohol, anisole, anthranilic acid methyl ester, acetophenone, benzylacetone, benzaldehyde, benzoic acid ethyl ester, benzophenone, benzyl alcohol, benzyl acetate, benzyl benzoate, benzyl formate, benzyl valerate, borneol, bornyl acetate, alpha-bromostyrene, n-decyl aldehyde, n-dodecyl aldehyde, eugenol, eugenol methyl ether, eucalyptol, farnesol, fenchone, fenchyl acetate, geranyl acetate, geranyl formate, heliotropin, hepticarboxylic acid methyl ester, heptaldehyde, hydroquinone dimethyl ether, hydroxycinnamaldehyde, hydroxycinnamyl alcohol, indole, iron, isoeugenol, isoeugenol methyl ether, isosafrole, jasmon, camphor, carvacrol, carvone, p-cresol methyl ether, coumarin, p-methoxyacetophenone, methyl n-amyl ketone, methyl anthranilic acid methyl ester, p-methyl acetophenone, methyl chavikol, p-methyl quinoline, methylβnaphthyl ketone, methyl-n-nonyl acetaldehyde, methyl n-nonyl ketone, muscone, β-naphthol ethyl ether, β-naphthol methyl ether, nerol, nitrobenzene, n-nonyl aldehyde, nonyl alcohol, n-octyl aldehyde, p-oxy acetophenone, pentadecanolide, β-phenylethyl alcohol, phenylacetaldehyde dimethyacetal, phenylacetic acid, pulegone, safrole, salicylic acid isoamyl ester, salicylic acid methyl ester, salicylic acid hexyl ester, salicylic acid cyclohexyl ester, santalol, skatole, terpineol, thyme, thymol, γ-undecalactone, vanillin, veratrum aldehyde, cinnamaldehyde, cinnamyl alcohol, cinnamic acid, cinnamic acid ethyl ester and cinnamic acid benzyl ester.

[0064] Further (more volatile) fragrances are alkyl isothiocyanates (alkyl mustard oils), butanedione, limonene, linalool, linayl acetate and propionate, menthol, menthone, methyl-n-heptenone, phellandrene, phenylacetaldehyde, terpinyl acetate, citral and citronellal.

[0065] Preferably, mixtures of different fragrances are used, which together produce an attractive fragrance.

[0066] Suitable perfume oils may also contain natural perfume mixtures, such as those obtainable from plant or animal sources, for example, pine, citrus, jasmine, rose, lily or ylang-ylang oil. Essential oils of lower volatility, which are mostly used as aroma components, are also suitable as perfume oils, for example, sage oil, chamomile oil, lemon balm oil, mint oil, cinnamon oil, lime blossom oil, juniper berry oil, vetiver oil, oliban oil, galbanum oil, laudanum oil, clove oil, iso-eugenol, thyme oil, bergamot oil, geranium oil and rose oil.

[0067] Preferred compositions as contemplated herein comprise at least one scent in a total amount of from about 0.1 to about 15% by weight, preferably from about 0.5 to about 10% by weight, particularly preferably from about 1 to about 8% by weight, most preferably from about 2 to about 7% by weight, further extremely preferably from about 3 to about 6% by weight, each based on the total weight of the propellant-free composition.

[0068] Further preferred compositions as contemplated herein comprise at least one so-called "skin-cooling active substance". Skin-cooling active substances in the context of the present application are understood to mean active substances which, on application to the skin due to surface anesthetization and irritation of the cold-sensitive nerves in migraine and the like, generate a pleasant feeling of cold, even when the treated skin areas actually show normal or elevated temperature. As contemplated herein, skin-cooling active substances are regarded as those compounds which, like l-menthol, stimulate the thermoreceptors in the skin and the mucous membranes in such a way that a cool sensory impression is created. In particular, the receptor CMR-1 ("cold and menthol-sensitive receptor"), which belongs to the family of TRP channels, is stimulated by the cooling substances, which produces a cold impression.

[0069] Preferred skin-cooling active substances are menthol, isopulegol and menthol derivatives, for example, menthyl lactate, menthylpyrrolidonecarboxylic acid, menthylmethyl ether, menthoxypropanediol, menthone-glycerol acetal (9-methyl-6-(1-methylethyl)-1,4-dioxaspiro(4.5)decane-2-methanol), monomenthyl succinate and 2-hydroxymethyl-3,5,5-trimethylcyclohexanol. Particularly preferred skin-cooling active substances are menthol, isopulegol, menthyl lactate, menthoxypropanediol and menthylpyrrolidonecarboxylic acid.

Preferred compositions as contemplated herein comprise at least one skin-cooling active substance in a total amount of from about 0.01 to about 1% by weight, preferably from about 0.02 to about 0.5% by weight and more preferably from about 0.05 to about 0.2% by weight, in each case based on the total weight of the (propellant-free) composition.

[0070] In a further embodiment preferred as contemplated herein, the compositions as contemplated herein contain 0 to at most about 5% by weight of ethanol.

[0071] Furthermore, the compositions as contemplated herein may comprise additional deodorant active substances. Antimicrobial, antibacterial or germ-inhibiting substances, antioxidants or odor adsorbents (e.g., zinc ricinoleate) can be used as deodorant active substances. Suitable antimicrobial, antibacterial or germ-inhibiting substances are in particular organohalogen compounds and halides, quaternary ammonium compounds, a range of plant extracts and zinc compounds. Preference is given to halogenated phenol derivatives, such as hexachlorophene or Irgasan DP 300 (triclosan, 2,4,4'-trichloro-2'-hydroxydiphenyl ether), 3,4,4'-trichlorocarbanilide, chlorhexidine (1,1'-hexamethylene-bis-[5-(4-chlorophenyl)]-biguanide), chlorhexidine gluconate, benzalkonium halides and cetylpyridinium chloride. Furthermore, sodium bicarbonate, sodium phenolsulfonate and zinc phenolsulfonate and, for example, the constituents of lime blossom oil can be used. Even less effective antimicrobial substances, which, however, have a specific effect against the gram-positive bacteria responsible for sweat decomposition can be used as deodorant active substances. Benzyl alcohol can also be used as a deodorant active substance. Further antibacterial deodorants are lantibiotics, glycoglycerolipids, sphingolipids (ceramides), sterols and other substances that inhibit bacterial adhesion to the skin, e.g., glycosidases, lipases, proteases, carbohydrates, di- and oligosaccharide fatty acid esters and alkylated monosaccharides and oligosaccharides. Preferred deodorant active substances are long-chain diols, for example 1,2-alkane (C_5-C_{18}) diols, glycerol mono (C_8-C_{18}) fatty acid esters or, more preferably, glycerol mono- (C_6-C_{16}) alkyl ethers, in particular 2-ethylhexyl glycerol ethers, which are very well tolerated by skin and mucous membranes and are active against corynebacteria, and furthermore phenoxyethanol, phenoxyisopropanol (3-phenoxy-propan-2-ol), anisalcohol, 2-methyl-5-phenyl-pentane-1-ol, 1,1-dimethyl-3-phenylpropan-1-ol, benzyl alcohol, 2-phenylethane-1-ol, 3-phenylpropan-1-ol, 4-phenylbutan-1-ol, 5-phenylpentane-1-ol , 2-benzylheptan-1-ol, 2,2-dimethyl-3-phenylpropan-1-ol, 2,2-dimethyl-3-(3'-

methylphenyl)-propan-1-ol, 2-ethyl-3-phenylpropan-1-ol, 2-ethyl-3-(3'-methylphenyl)-propan-1-ol, 3-(3'-chlorophenyl)-2-ethyl-propan-1-ol, 3-(2'-chlorophenyl)-2-ethyl-propan-1-ol, 3-(4'-chlorophenyl)-2-ethyl-propan-1-ol, 3-(3',4'-dichlorophenyl)-2-ethyl-propan-1-ol, 2-ethyl-3-(2'-methylphenyl)-propan-1-ol, 2-ethyl-3-(4'-methylphenyl)-propan-1-ol, 3-(3',4'-dimethylphenyl)-2-ethyl-propan-1-ol, 2-ethyl-3-(4'-methoxyphenyl)-propan-1-ol, 3-(3',4'-dimethoxyphenyl)-2-ethyl-propan-1-ol, 2-allyl-3-phenylpropan-1-ol and 2-n-pentyl-3-phenylpropan-1-ol.

[0072] Complex-forming substances can also support the deodorizing effect by stably complexing the oxidative catalytically active heavy metal ions (e.g., iron or copper). Suitable complexing agents are, for example, the salts of ethylenediaminetetraacetic acid or nitrilotriacetic acid and the salts of 1-hydroxyethane-1,1-diphosphonic acid.

[0073] A further embodiment of the compositions as contemplated herein comprise at least one encapsulated active substance. The active substances which can be advantageously encapsulated are, in particular, deodorizing active substances, fragrances, perfume oils and/or skin-cooling active substances, but also other skin-care active substances, such as vitamins, antioxidants, etc. Preferred capsule material are water-soluble polymers such as carboxymethylcellulose, methylcellulose, hydroxyethylcellulose or hydroxypropylmethylcellulose, carrageenans, alginates, maltodextrins, dextrins, vegetable gums, pectins, xanthans, polyvinyl acetate and polyvinyl alcohol, polyvinylpyrrolidine, polyamides, polyesters and homo- and copolymers of monomers selected from acrylic acid, methacrylic acid, maleic acid, fumaric acid, itaconic acid and the esters and the salts of these acids, and any mixtures of these polymers. Suitable capsule materials are also described, for example, in WO 2010/009977 A2.

[0074] In a further particularly preferred embodiment, the compositions as contemplated herein may comprise both at least one antiperspirant active substance and at least one deodorant active substance.

[0075] The preparation of the compositions as contemplated herein which are applied as a spray preferably depends on the requirements of the desired spray application.

[0076] The compositions as contemplated herein may be present in the form of a suspension, that is, the antiperspirant active substance and optionally further insoluble constituents are suspended in a liquid or solid carrier. Liquid-disperse systems of this type, for example, as roll-ons or as a dispersion to be applied as a spray, should be shaken before use.

[0077] Preferred compositions as contemplated herein may be packaged, for example, in pump or squeeze dispensers, in particular in multi-chamber pump or squeeze dispensers. Such dispensers use air, in particular the ambient air, as a propellant or transport the composition as contemplated herein by pumping.

In a further preferred embodiment of the present disclosure, the composition may be applied by means of a compressed or liquefied propellant. For this purpose, the composition as contemplated herein may be packaged together with a propellant in a spray can. Propellant and composition as contemplated herein may be be present as a mixture. However, it is also possible for the propellant and composition as contemplated herein to be present separately from one another, for example, in the case of so-called bag-in-can spray cans.

[0078] Unless specified otherwise, all amount specifications are based on the weight of the propellant-free composition.

[0079] The packaging in a multi-chamber dispenser offers special technical advantages. The multi-chamber dispenser may also be used so that one chamber is filled with the composition as contemplated herein, while another chamber contains the compressed propellant. Such a multi-chamber dispenser is, for example, a so-called bag-in-can packaging.

[0080] However, both chambers can also be joined together in such a way that the composition as contemplated herein is separated into two partial compositions which can be dispensed simultaneously from the packaging, for example, from separate openings or from a single opening.

[0081] Further preferred compositions as contemplated herein may be packaged with at least one propellant in a suitable pressure container.

[0082] Propellants (propellant gases) preferred as contemplated herein are selected from propane, propene, n-butane, isobutane, isobutene, n-pentane, pentene, isopentane, isopentene, methane, ethane, dimethyl ether, nitrogen, air, oxygen, nitrous oxide, dichlorofluoromethane, chlorodifluoromethane, chlorofluoromethane, 1,1,2,2-tetrachloro-1-fluoroethane, 1,1,1,2-tetrachloro-2-fluoroethane, 1,2,2-trichloro-1,1-difluoroethane, 1,1,2-trichloro-1,2-difluoroethane, 1,1,1-trichloro-2,2-difluoroethane, 2,2-dichloro-1,1,1-trifluoroethane, 1,2-dichloro-1,1,2-trifluoroethane, 2-chloro-1,1,1,2-tetrafluoroethane, 1-chloro-1,1,2,2-tetrafluoroethane, 1,1,2-trichloro-2-fluoroethane, 1,2-dichloro-1,2-difluoroethane, 1,2-dichloro-1,1-difluoroethane, 1-chloro-1,2,2-trifluoroethane, 2-chloro-1,1,1-trifluoroethane, 1-chloro-1,1,2-trifluoroethane, 1,2-dichloro-1-fluoroethane, 1,1-dichloro-1-fluoroethane, 2-chloro-1,1-difluoroethane, 1-chloro-1,1-difluoroethane, 1-chloro-2-fluoroethane, 1-chloro-1-fluoroethane, 2-chloro-1,1-difluoroethene, 1,1,1,3-tetrafluoroethane, heptafluoro-n-propane, perfluoroethane, monochlorodifluoromethane, 1,1-difluoroethane, both individually and in combination.

[0083] Particularly preferred are propane, n-butane, isobutane and, most preferably, mixtures of these propellants. Further, also preferred are 1,1-difluoroethane, propane, n-butane, isobutane and mixtures of these propellants, in particular mixtures of 1,1-difluoroethane and n-butane. Hydrophilic propellants, such as carbon dioxide, may also be advantageously used in the context of the present disclosure, when the fraction of hydrophilic gases is selected low and lipophilic propellant gas (e.g., propane/butane) is present in excess. Propane, n-butane, isobutane and mixtures of these propellants are particularly preferred. It has been found that the use of n-butane as sole propellant gas can be particularly preferred as contemplated herein.

[0084] The amount of propellant is preferably from about 10 to about 95% by weight, more preferably from about 30 to about 90% by weight and most preferably from about 60 to about 86% by weight, and still more preferably about 70, about 72, about 74, about 76, about 78, about 82, about 84 or about 85% by weight, each based on the total weight of the

preparation including of the composition as contemplated herein (suspension) and the propellant.

[0085] Vessels made of metal (aluminum, tinplate, tin), protected or non-splitting plastic or made of glass, which is coated with plastic outside, may be considered as a pressurized gas container, where in their selection, pressure and fracture resistance, corrosion resistance, easy fillability and aesthetic aspects, handiness, printability, etc. play a role. Special interior protective lacquers ensure corrosion resistance with respect to the suspension as contemplated herein. An inner protective lacquer preferred as contemplated herein is an epoxy phenolic lacquer, which is obtainable, among other things, under the name Hoba 7407 P. Particularly preferably, the valves used have an internally lacquered valve disk, wherein lacquer and valve material are compatible with each other. If aluminum valves are used, their valve disks can be coated inside, for example, with Micoflex lacquer. If tinplate valves are used as contemplated herein, their valve disks can be coated on the inside, for example, with PET (polyethylene terephthalate).

[0086] The cans are preferably equipped with a suitable spray head. Depending on the spray head, discharge rates, based on fully filled cans, of 0.1 g/s to 2.0 g/s are possible.

[0087] Further, a subject of the present disclosure is a sprayable antiperspirant containing a composition as contemplated herein, wherein the composition is present in an aerosol can with a compressed gaseous propellant.

[0088] A further subject of the present disclosure is a non-therapeutic, cosmetic method for reducing and/or regulating perspiration and/or body odor, in which a composition as contemplated herein is applied in an effective amount to the skin, preferably to the skin in the underarm region.

[0089] A further subject of the present disclosure is the use of rice starch and a hydrophobically modified clay mineral in suspensions of antiperspirant active substances in oils in substantially anhydrous antiperspirant compositions, preferably for improving the

stability of the suspension, wherein the antiperspirant compositions are particularly preferred compositions as contemplated herein.

[0090] The present disclosure is further described by the following examples without being limited thereto.

EXAMPLES

[0091] The ingredients (see table) were mixed at 30°C and homogenized to prepare the antiperspirant suspensions. Each 100 mL of the preparations were stored for 24 h at room temperature in stationary cylinders. The deposition of the clear oil phase indicates the sedimentation of the ACH particles (aluminum chlorhydroxide). Only the combination of rice starch with a hydrophobically modified clay mineral (Disteardimonium Hectorite (Bentone® 38 V CG)) gives the desired effect.

[0092] Table 1 shows four comparative formulations (V1), (V2), (V3) and (V4) and a formulation (E) as contemplated herein, wherein the present disclosure is not limited to these.

Table 1 Four comparative formulations (V1), (V2), (V3) and (V4) and a formulation (E) as contemplated herein, and the evaluation of the sedimentation of the individual formulations after 24 h

	V1	V2	V3	V4	E
	% by weight	% by weight	% by weight	% by weight	% by weight
Octenylsuccinate of a hydrolyzed corn starch	-	0.5	-	-	-
Rice starch	-	-	0.5	-	0.5
Disteardimonium hectorite	-	2.5	-	2.5	2.5
Cyclopentasiloxane	29.5	26.5	29.0	28.0	26.5
Isopropyl myristate	30.0	30.0	30.0	30.0	30.0
Ethylhexyl palmitate	6.0	6.0	6.0	6.0	6.0
Dimethicone 5 cSt	10.0	10.0	10.0	10.0	10.0
Propylene carbonate	1.0	1.0	1.0	1.0	1.0
Aluminum chlorohydrate (spherical particles)	23.5	23.5	23.5	23.5	23.5
Sedimentation after 24 h at room temperature	Strong (6 cm clear oil)	Strong (5 cm clear oil)	Moderate (3 cm clear oil)	Weak (2 cm clear oil)	none

[0093] Table 2 shows three inventive compositions (E1), (E2) and (E3), which are filled in a weight ratio of 3:17 with the propellant propane/butane (15/85) in aerosol cans.

Table 2 Three compositions as contemplated herein (E1), (E2) and (E3), which are filled in a weight ratio of 3:17 with the propellant propane/butane (15/85) in aerosol cans

	E1	E2	E3
	% by weight	% by weight	% by weight
Cyclopentasiloxane (Xiameter® 0245 fluid)	21.5	21.1	21.7
Isopropyl palmitate (BASF)	30.0	30.0	30.0
Ethyl hexyl palmitate (Cegesoft C24, BASF)	6.0	6.0	6.0
Rice starch (rice starch D.S.A. 7, Agrana AG)	0.5	0.9	0.3
Dimethicone (Xiameter® PMX-200 Fluid 5CS)	10.0	10.0	10.0
Disteardimonium hectorite	2.5	2.5	2.5
Propylene carbonate	1.0	1.0	1.0
Aluminum chlorohydrate (AACH 7172, SummitRheheis)	23.5	23.5	23.5
Perfume	5.0	5.0	5.0

[0094] While at least one exemplary embodiment has been presented in the foregoing detailed description, it should be appreciated that a vast number of variations exist. It should also be appreciated that the exemplary embodiment or exemplary embodiments are only examples, and are not intended to limit the scope, applicability, or configuration of the various embodiments in any way. Rather, the foregoing detailed description will provide those skilled in the art with a convenient road map for implementing an exemplary embodiment as contemplated herein. It being understood that various changes may be made in the function and arrangement of elements described in an exemplary embodiment without departing from the scope of the various embodiments as set forth in the appended claims.

Claims

1. An antiperspirant composition for personal body care comprising:
   a) at least one antiperspirant active substance present in the form of spherical particles, in suspended, undissolved form, and selected from aluminum salts in a total amount of 5-40% by weight,
   b) 0.1-10% by weight of rice starch,
   c) 0.1-10% by weight of hydrophobically modified clay mineral,
   d) at least one oil in a total amount of 20-94.8% by weight,

wherein all weight % specifications are based on the weight of the composition, without taking into account the weight of any propellants that are present.

2. The composition according to claim 1, wherein the at least one antiperspirant active substance (a) is aluminum chlorohydrate.

3. The composition according to claim 1 or claim 2, wherein the composition comprises the at least one antiperspirant active substance (a) in a total amount of from 10-35% by weight, or 15-28% by weight, or 23-27% by weight,

4. The composition according to any one of the preceding claims, wherein the composition comprises 0.4-2% by weight of rice starch.

5. The composition according to any one of the preceding claims, wherein the composition comprises 1.5-3.5% by weight of hydrophobically modified clay mineral.

6. The composition according to any one of the preceding claims, wherein the composition comprises the at least one oil in a total amount of 40-85% by weight, or 50-80% by weight, or 60-75% by weight.

7. The composition according to any one of the preceding claims, wherein the rice starch is present as a powder treated with cationic surfactants, wherein the fraction of cationic surfactants is 0.01-0.3% by weight, based on the weight of the rice starch.

8. The composition according to any one of the preceding claims, wherein the hydrophobically modified clay mineral is selected from hydrophobically modified hectorites, hydrophobically modified bentonites and hydrophobically modified montmorillonites.

9. The composition according to claim 8, wherein the hydrophobically modified clay mineral is selected from disteardimonium hectorite, stearalkonium hectorite, quaternium-18 hectorite and quaternium-18 bentonite.

10. The composition according to ant one of the preceding claims, wherein 70-95% by weight of the spherical particles have a size above 10 µm, 80-100% by weight of the spherical particles have a size of up to 75 µm, and 90-100% by weight of the spherical particles have a size up to 125 µm, each based on the weight of the antiperspirant active substance.

11. The composition according to any one of the preceding claims, wherein the at least one oil is a mixture of at least two oils comprising at least one volatile silicone oil in a total amount of 10 to 40% by weight, or 15 to 35% by weight, or 20 to 30% by weight, and at least one non-volatile oil in a total amount of 10 to 50% by weight, or 20 to 45% by weight, or 25 to 40% by weight, and optionally at least one non-volatile silicone oil in a total amount of 0-20% by weight, or 3-15% by weight, or 6-13% by weight.

12. The composition according to claim 11, wherein the at least one volatile silicone oil is selected from octamethylcyclotetrasiloxane, decamethylcyclopentasiloxane, dodecamethylcyclohexasiloxane, hexamethyldisiloxane, octamethyltrisiloxane and decamethyltetrasiloxane, and mixtures thereof.

13. The composition of claim 12, wherein the at least one volatile silicone oil is selected from decamethylcyclopentasiloxane, mixtures of decamethylcyclopentasiloxane and dodecamethylcyclohexasiloxane, and mixtures of hexamethyldisiloxane, octamethyltrisiloxane and decamethyltetrasiloxane.

14. The composition of claims 12 or 13, wherein the at least one volatile silicone oil is or comprises decamethylcyclopentasiloxane.

15. The composition according to claims 11 to 14, wherein the at least one non-volatile oil is selected from isopropyl myristate, isopropyl palmitate, isopropyl stearate, 2-ethylhexyl palmitate, 2-ethylhexyl stearate and triethyl citrate and mixtures of the aforementioned esters.

16. The composition according to any of claims 11 to 15, wherein the at least one nonvolatile silicone oil is polydimethylsiloxane having a viscosity of 5 cSt.

17. The composition according to any one of the preceding claims, wherein the at least one antiperspirant active substance (a) is present in a total amount of 5-40% by weight, based on the total weight of the propellant-free composition.

18. The composition according to any one of the preceding claims, wherein the composition comprises at least one perfume in a total amount of 0.1-15% by weight, based on the total weight of the propellant-free composition.

19. A non-therapeutic, cosmetic method for reducing and/or regulating perspiration and/or body odor, comprising applying an effective amount of a composition according to any one of claims 1 to 18 to the skin, such as the the skin of the underarm region.

20. Use of rice starch and a hydrophobically modified clay mineral in suspensions of antiperspirant active substances in the form of spherical particles suspended in oils in substantially anhydrous antiperspirant compositions for increasing the stability of the suspension.

21. The use of rice starch and a hydrophobically modified clay mineral according to claim 20, wherein the antiperspirant compositions are compositions according to any one of claims 1 to 18.

22. A sprayable antiperspirant comprising a composition according to any one of claims 1 to 18, wherein the composition is contained in an aerosol can with a compressed gaseous propellant.