



US 20050002890A1

(19) **United States**

(12) **Patent Application Publication** (10) **Pub. No.: US 2005/0002890 A1**
Gardel et al. (43) **Pub. Date: Jan. 6, 2005**

(54) **SKIN MAKEUP COMPOSITIONS HAVING
OPTIMIZED APPLICATION QUALITIES**

(75) Inventors: **Nadia Gardel**, Bourg La Reine (FR);
Veronique Barrois, Paris (FR)

Correspondence Address:
OLIFF & BERRIDGE, PLC
P.O. BOX 19928
ALEXANDRIA, VA 22320 (US)

(73) Assignee: **L'OREAL**, Paris (FR)

(21) Appl. No.: **10/849,825**

(22) Filed: **May 21, 2004**

Related U.S. Application Data

(60) Provisional application No. 60/506,774, filed on Sep.
30, 2003.

(30) **Foreign Application Priority Data**

May 22, 2003 (FR)..... 03 06150

Publication Classification

(51) **Int. Cl.⁷** **A61K 7/06**; A61K 7/11

(52) **U.S. Cl.** **424/70.16**

(57) **ABSTRACT**

The present invention relates to a fluid cosmetic composition in the form of a water-in-oil emulsion comprising a liquid fatty phase, an aqueous phase and a dimethicone copolyol, characterized in that it comprises solid particles of polymethyl methacrylate and in that the liquid fatty phase comprises isododecane, the said composition being free of cyclotetrasiloxane.

SKIN MAKEUP COMPOSITIONS HAVING OPTIMIZED APPLICATION QUALITIES

[0001] The present invention relates to a skin makeup composition and more particularly a composition of fluid foundation type, having optimized application qualities.

[0002] In general, producing a satisfactory makeup effect on the skin using a foundation involves being able to distribute the said foundation uniformly over the entire surface to be made up. To do this, it is necessary for the foundation formulation to have slip qualities that are sufficient to allow good handling, especially for the purpose of covering the entire surface to be made up. It is this that especially makes it possible in the end to have a uniform makeup effect, without marks or demarcations.

[0003] More particularly, the inventors have demonstrated that the presence of an effective amount of polymethyl methacrylate, also known as PMMA, in certain compositions of foundation type are specifically advantageous in these terms.

[0004] Polymethyl methacrylates are generally in the form of hollow white spherical particles generally of the order of a micrometre in size. These particles have the particular feature of having high water or oil adsorption capacity, which is particularly advantageous in cosmetic formulations. Thus, in oil-based cosmetic compositions, by partially adsorbing these oils, they give the corresponding composition a dry and powdery feel. Moreover, in formulations of lipstick base type, they allow 10% to 30% of water to be incorporated. These hollow spherical particles of polymethyl methacrylate have thus already been proposed for encapsulation or reservoir purposes, in dry oils, water-based lipsticks and free or compacted powders with a high oil or water content.

[0005] The inventors have found, unexpectedly, that the presence of polymethyl methacrylate can also be a deciding factor for optimizing the properties of cosmetic compositions such as, especially, "fluid" foundations, in terms of application.

[0006] Consequently, according to a first aspect, the main subject of the present invention is a fluid cosmetic composition in the form of a water-in-oil emulsion comprising a liquid fatty phase, an aqueous phase and a dimethicone copolyol, characterized in that it comprises solid particles of polymethyl methacrylate and in that the liquid fatty phase comprises isododecane, the said composition being free of cyclotetrasiloxane.

[0007] According to a second aspect, the present invention is also directed towards a fluid cosmetic composition in the form of a water-in-oil emulsion comprising a liquid fatty phase, an aqueous phase, a dimethicone copolyol and a C₈-C₂₂ alkyl dimethicone copolyol, characterized in that it comprises solid particles of polymethyl methacrylate and in that the liquid fatty phase comprises a volatile hydrocarbon-based oil, the said composition being free of cyclotetrasiloxane.

[0008] According to another of its aspects, a subject of the present invention is also a process for making up the skin, characterized in that it comprises the application to the skin of at least one composition in accordance with the invention.

[0009] Polymethyl Methacrylates

[0010] The polymethyl methacrylates are generally in the form of hollow or solid white spherical particles generally with a micrometre-scale number-average size, in particular ranging from 5 to 20 microns and generally ranging from 7 to 15 microns. The expression "number-average size" denotes the size given by the statistical particle size distribution to half of the population, referred to as D50.

[0011] It is also possible to characterize these polymethyl methacrylate particles by their density, which can vary especially as a function of the size of the spherical cavity of the said particles.

[0012] In the context of the present invention, this density is assessed according to the following protocol, referred to as the packed density:

[0013] m=40 g of powder is poured into a measuring cylinder; the measuring cylinder is then placed on a STAV 2003 machine from STAMPF VOLUMETER; the measuring cylinder is then subjected to 1500 packing motions; the final volume Vf of packed powder is then measured directly on the measuring cylinder. The packed density is determined by the ratio m/vf, in this instance 40/Vf (Vf being expressed in cm³ and m in g).

[0014] In particular, the density of the polymethyl methacrylate particles that may be used according to the invention may range from 0.3 to 0.95, especially from 0.45 to 0.80 and more particularly from 0.5 to 0.75.

[0015] According to one particular embodiment of the invention, the composition according to the invention comprises at least two polymethyl methacrylates that differ in their density.

[0016] According to this variant of the invention, the composition may comprise two types of polymethyl methacrylate particle, the difference in density of which is at least 0.12, especially at least 0.15, in particular at least 0.18 and more particularly at least 0.22.

[0017] By way of illustration, a composition according to the invention can combine a polymethyl methacrylate of density 0.5 with a second polymethyl methacrylate of density 0.75.

[0018] The polymethyl methacrylates of different densities may be combined in weight proportions ranging, respectively, from 40% to 60%, especially from 45% to 55% and in particular from 48% to 52% by weight relative to the total weight of polymethyl methacrylates, or even in a weight ratio of 1.

[0019] Without wishing to be bound to any theory, it appears that the polymethyl methacrylate powders with a density of greater than 0.5 are more particularly advantageous for prolonging the slip qualities of the composition over time. As regards the polymethyl methacrylate particles with a density of less than or equal to 0.5, these would appear to be more advantageous in terms of handling of the said composition. In other words, the foundation can be put on more quickly.

[0020] According to one particular variant of the invention, the content of polymethyl methacrylate of higher density is predominant over the content of polymethyl methacrylate of lower density.

[0021] In particular, the polymethyl methacrylate particles of higher density may be solid particles, and the polymethyl methacrylate particles of lower density may be hollow particles.

[0022] The polymethyl methacrylates according to the invention may be present in the composition in an amount ranging from 1% to 10% by weight, in particular from 2% to 7% and more particularly from 2.5% to 5.5% by weight relative to the total weight of the composition.

[0023] As non-limiting illustrations of the polymethyl methacrylates that are suitable for the invention, mention may be made especially of the polymethyl methacrylate particles sold by the company WACKHERR under the name Covabead LH 85 and those sold by the company NIHON JUNYAKU under the name JURYMER MB1.

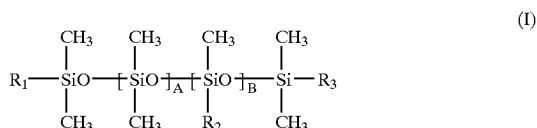
[0024] In the context of the present invention, the polymethyl methacrylates are advantageously formulated in a liquid fatty phase comprising at least one volatile oil.

[0025] Dimethicone Copolyol

[0026] The composition according to the invention comprises at least one dimethicone copolyol.

[0027] This dimethicone copolyol is an oxypropylenated and/or oxyethylenated polydimethyl methyl siloxane. It contains no long-chain alkyl groups of more than 8 carbon atoms, especially C₈-C₂₂.

[0028] Dimethicone copolyols that may be used include those corresponding to formula (I) below:



[0029] in which:

[0030] R₁, R₂ and R₃, independently of each other, represent a C₁-C₆ alkyl radical or a radical $-(\text{CH}_2)_x-(\text{OCH}_2\text{CH}_2)_y-(\text{OCH}_2\text{CH}_2\text{CH}_2)_z-$, —OR₄, at least one radical R₁, R₂ or R₃ not being an alkyl radical, R₄ being a hydrogen, a C₁-C₃ alkyl radical or a C₂-C₄ acyl radical;

[0031] A is an integer ranging from 0 to 200;

[0032] B is an integer ranging from 0 to 50; with the condition that A and B are not simultaneously equal to 0;

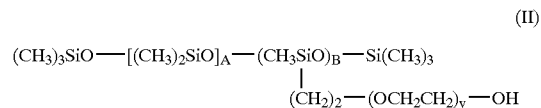
[0033] x is an integer ranging from 1 to 6;

[0034] y is an integer ranging from 1 to 30; and

[0035] z is an integer ranging from 0 to 5.

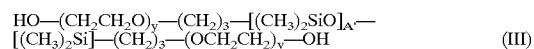
[0036] According to one preferred embodiment of the invention, in the compound of formula (I), R₁=R₃=methyl radical, x is an integer ranging from 2 to 6 and y is an integer ranging from 4 to 30. R₄ is in particular a hydrogen.

[0037] Examples of compounds of formula (I) that may be mentioned included the compounds of formula (II):



[0038] in which A is an integer ranging from 20 to 105, B is an integer ranging from 2 to 10 and y is an integer ranging from 10 to 20.

[0039] Examples of silicone compounds of formula (I) that may also be mentioned include the compounds of formula (III):



[0040] in which A' and y are integers ranging from 10 to 20.

[0041] Dimethicone copolyols that may be used include those sold under the names DC 5329, DC 7439-146, DC 2-5695 and Q4-3667 by the company DOW CORNING; KF-6013, KF-6015, KF-6016 and KF-6017 by the company SHIN-ETSU.

[0042] The compounds DC 5329, DC 7439-146 and DC 2-5695 are compounds of formula (II) in which, respectively, A is 22, B is 2 and y is 12; A is 103, B is 10 and y is 12; A is 27, B is 3 and y is 12.

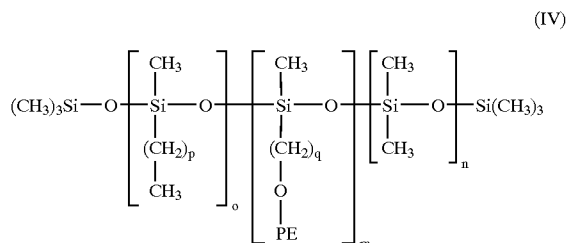
[0043] The dimethicone copolyol may be present in the composition according to the invention in a content ranging from 5% to 10% by weight, preferably ranging from 5% to 8% by weight and preferentially ranging from 5% to 7% by weight, relative to the total weight of the composition.

[0044] Alkyl Dimethicone Copolyol

[0045] According to the second aspect of the invention, the composition contains at least one C₈-C₂₂ alkyl dimethicone copolyol.

[0046] The C₈-C₂₂ alkyl dimethicone copolyol present in the composition according to the invention may be in particular an oxypropylenated and/or oxyethylenated poly-methyl (C₈-C₂₂)alkyl dimethyl methyl siloxane.

[0047] The C₈-C₂₂ alkyl dimethicone copolyol is advantageously a compound of formula (IV) below:



[0048] in which:

[0049] PE represents $(-\text{C}_2\text{H}_4\text{O})_x-(\text{C}_3\text{H}_6\text{O})_y-\text{R}$, R being chosen from a hydrogen atom and an alkyl radical containing from 1 to 4 carbon atoms, x

ranging from 0 to 100 and y ranging from 0 to 80, x and y not simultaneously being 0;

[0050] m ranging from 1 to 40;

[0051] n ranging from 10 to 200;

[0052] o ranging from 1 to 100;

[0053] p ranging from 7 to 21; and

[0054] q ranging from 0 to 4, and in particular:

[0055] R=H;

[0056] m=1 to 10;

[0057] n=10 to 100;

[0058] o=1 to 30;

[0059] p=15; and

[0060] q=3.

[0061] C₈-C₂₂ alkyl dimethicone copolyols that may be mentioned include cetyl dimethicone copolyol, for instance the product sold under the name Abil EM-90 by the company Goldschmidt.

[0062] The C₈-C₂₂ alkyl dimethicone copolyol may be present in the composition according to the invention in a content ranging from 0.5% to 2% by weight and in particular ranging from 0.5% to 1.5% by weight relative to the total weight of the composition.

[0063] Fatty Phase

[0064] The term "liquid fatty phase" means any non-aqueous medium that is liquid at room temperature (25° C.) and atmospheric pressure (760 mmHg), composed of one or more fatty substances that are liquid at room temperature. This liquid fatty phase may contain a volatile liquid organic phase and/or a non-volatile liquid organic phase.

[0065] The term "volatile organic phase" means any non-aqueous medium capable of evaporating from the skin in less than one hour at room temperature and atmospheric pressure. This volatile phase especially comprises oils with a vapour pressure, at room temperature (25° C.) and atmospheric pressure (760 mmHg), ranging from 0.13 Pa to 40 000 Pa (10⁻³ to 300 mmHg), especially ranging from 1.3 Pa to 13 000 Pa (0.01 to 100 mmHg) and in particular ranging from 1.3 Pa to 1300 Pa (0.01 to 10 mmHg).

[0066] In addition, the volatile oil generally has a boiling point, measured at atmospheric pressure, ranging from 150° C. to 260° C. and especially ranging from 170° C. to 250° C.

[0067] Advantageously, the volatile organic phase contains one or more volatile organic oils with a flash point ranging from 30° C. to 102° C., in particular from 40° C. to 55° C. and especially from 40° C. to 50° C., and mixtures thereof.

[0068] The term "non-volatile organic phase" means any medium capable of remaining on the skin for several hours. A non-volatile liquid organic phase in particular has a non-zero vapour pressure at room temperature and atmospheric pressure, of less than 0.001 mmHg (0.13 Pa).

[0069] The liquid fatty phase of the emulsion according to the invention contains at least one volatile hydrocarbon-based oil, which, according to a first aspect of the invention, is at least isododecane.

[0070] The term "hydrocarbon-based oil" means an oil formed essentially from, or even consisting of, carbon and hydrogen atoms, and possibly oxygen and nitrogen atoms, and containing no silicon or fluorine atoms. It may contain alcohol, ester, ether, carboxylic acid, amine and/or amide groups.

[0071] As volatile oils that may be used in the invention, mention may be made of linear or branched hydrocarbon-based volatile oils containing from 8 to 16 carbon atoms, and mixtures thereof, and especially branched C₈-C₁₆ alkanes, for instance C₈-C₁₆ isoalkanes (also known as isoparaffins), isododecane, isohexadecane, for example the oils sold under the trade names Isopar® or Permethyl®, and branched C₈-C₁₆ esters, for instance isohexyl neopentanoate, and mixtures thereof. Isododecane is used in particular.

[0072] The volatile hydrocarbon-based oil, and especially isododecane, may be present in a content ranging from 5% to 25% by weight, especially ranging from 10% to 20% by weight and in particular ranging from 10% to 15% by weight, relative to the total weight of the composition.

[0073] The emulsion according to the invention may comprise an additional volatile oil, i.e. an oil other than the volatile oil required according to the invention, which may be chosen from hydrocarbon-based volatile oils, this oil being other than isododecane when the composition comprises isododecane, volatile silicone oils optionally comprising alkyl or alkoxy groups that are pendent or at the end of a silicone chain, and volatile fluoro oils, and mixtures thereof.

[0074] As volatile silicone oils that may be used in the invention, mention may be made of linear, branched or cyclic silicone oils with a viscosity at room temperature of less than 8 mm²/s and especially containing from 2 to 7 silicon atoms, these silicones optionally comprising alkyl or alkoxy groups containing from 1 to 10 carbon atoms that are pendent or at the end of each silicone. As volatile silicone oils that may be used in the invention, mention may especially be made of octamethylcyclotetrasiloxane, decamethylcyclopenta-siloxane, dodecamethylcyclohexasiloxane, heptamethylhexyltrisiloxane, heptamethyloctyltrisiloxane, hexamethyldisiloxane, octamethyltrisiloxane, decamethyl-tetrasiloxane and dodecamethylpentasiloxane, and mixtures thereof. On the other hand, the silicone oil cyclotetrasiloxane will not be considered according to the invention, especially on account of its lack of harmlessness.

[0075] The volatile fluoro oil generally does not have a flash point.

[0076] Volatile fluoro oils that may be mentioned include nonafluoroethoxybutane, nonafluoromethoxybutane, decafluoropentane, tetradecafluorohexane and dodecafluoropentane, and mixtures thereof.

[0077] Advantageously, the additional volatile oil represents from 20% to 32% by weight, especially from 20% to 30% by weight and in particular from 22% to 26% by weight, relative to the total weight of the composition.

[0078] The composition may also comprise at least one non-volatile oil.

[0079] As non-volatile oils that may be used in the invention, mention may be made of hydrocarbon-based oils of mineral or synthetic origin, such as linear or branched hydrocarbons, for instance liquid paraffin or derivatives thereof, liquid petroleum jelly, polydecenes, hydrogenated polyisobutene such as Parleam sold by the company NIP-PON Oil Fats, and squalane of synthetic or plant origin; oils of animal origin, for instance mink oil, turtle oil or perhydro-squalene; hydrocarbon-based oils of plant origin with a high triglyceride content consisting of fatty acid esters of glycerol, the fatty acids of which may have varying chain lengths, these chains possibly being linear or branched, and saturated or unsaturated, especially fatty acid triglycerides especially of 4 to 22 carbon atoms, for instance heptanoic or octanoic acid triglyceride, and capric/caprylic acid triglyceride, or alternatively hydroxylated triglycerides, such as sweet almond oil, calophyllum oil, palm oil, grapeseed oil, sesame oil, arara oil, rapeseed oil, sunflower oil, cotton oil, apricot oil, castor oil, alfalfa oil, marrow oil, blackcurrant oil, macadamia oil, musk rose oil, hazelnut oil, avocado oil, jojoba oil, olive oil, cereal (maize, wheat, barley or rye) germ oil, or shea butter; fatty acid esters, in particular of 4 to 22 carbon atoms, and especially of octanoic acid, of heptanoic acid, of lanolic acid, of oleic acid, of lauric acid or of stearic acid, for instance propylene glycol dioctanoate, propylene glycol monoisostearate, polyglyceryl-2 diisostearate or neopentyl glycol diheptanoate; synthetic esters of formula $R_1 \text{ COOR}_2$ in which R_1 represents a linear or branched higher fatty acid residue containing from 7 to 40 carbon atoms and R_2 represents a branched hydrocarbon-based chain containing from 3 to 40 carbon atoms, for instance purcellin oil (cetostearyl octanoate), isononyl isononanoate, C_{12} to C_{15} alkyl benzoate, 2-ethylhexyl palmitate, 2-octyldodecyl stearate, 2-octyldodecyl erucate, isostearyl isostearate, 2-octyldodecyl benzoate, alcohol or polyalcohol octanoates, decanoates or ricinoleates, isopropyl myristate, isopropyl palmitate, butyl stearate, hexyl laurate, diisopropyl adipate, 2-ethylhexyl palmitate, 2-hexyldodecyl laurate, 2-octyldodecyl palmitate, 2-octyldodecyl myristate, 2-diethylhexyl succinate, diisostearyl malate or glyceryl triisostearate or diglyceryl triisostearate; hydroxylated esters, for instance isostearyl lactate, octyl hydroxystearate, octyldodecyl hydroxystearate, diisostearyl malate, triisocetyl citrate; diethylene glycol diisononanoate; pentaerythritol esters; esters of aromatic acids and of alcohols containing 4 to 22 carbon atoms, especially tridecyl trimellitate; C_8 - C_{26} higher fatty acids such as oleic acid, linoleic acid, linolenic acid or isostearic acid; C_8 - C_{26} higher fatty alcohols such as oleyl alcohol, linoleyl alcohol, linolenyl alcohol, isostearyl alcohol or octyldodecanol; synthetic ethers containing at least 7 carbon atoms, silicone oils such as polydimethylsiloxanes (PDMS) that are liquid at room temperature, linear, and optionally phenylated, such as phenyltrimethicones, phenyltrimethylsiloxydiphenylsiloxanes, diphenyl dimethicones, diphenylmethyldiphenyltrisiloxanes, liquid 2-phenylethyl trimethylsiloxysilicates, optionally substituted with aliphatic and/or aromatic groups, for instance alkyl, alkoxy or phenyl groups, which are pendent and/or at the end of a silicone chain, these groups containing from 2 to 24 carbon atoms and being optionally fluorinated, or with functional groups such as hydroxyl, thiol and/or amine groups; polysiloxanes modified

with fatty acids, fatty alcohols or polyoxyalkylenes, for instance dimethicone copolyols or alkylmethicone copolyols; liquid fluorosilicones; or caprylic/capric acid triglycerides, for instance those sold by the company STEARINERIES DUBOIS or those sold under the names Miglyol 810, 812 and 818 by the company DYNAMIT NOBEL; and mixtures thereof.

[0080] The composition may comprise one or more non-volatile oils in a content ranging from 0.1% to 12% by weight and especially from 1% to 5% by weight relative to the total weight of the composition.

[0081] The composition according to the invention may also comprise at least one wax, at least one gum and/or at least one pasty fatty substance, which is silicone-based or non-silicone-based, of plant, animal, mineral or synthetic origin.

[0082] For the purpose of the present invention, the term "wax" means a lipophilic fatty compound that is solid at room temperature (25° C.), with a reversible solid/liquid change of state, having a melting point of greater than 30° C. which may be up to 200° C., a hardness of greater than 0.5 MPa, and having an anisotropic crystal organization in the solid state. By bringing the wax to its melting point, it is possible to make it miscible with oils and to form a microscopically homogeneous mixture, but on returning the temperature of the mixture to room temperature, recrystallization of the wax in the oils of the mixture is obtained.

[0083] For the purposes of the present invention, the waxes may be hydrocarbon-based waxes, silicone waxes and/or fluoro waxes, optionally comprising ester or hydroxyl functions. They are especially of natural origin, for instance optionally modified beeswax, camauaba wax, candelilla wax, ouricury wax, Japan wax, cork fibre wax or sugarcane wax, ceresin, paraffin wax, lignite wax, microcrystalline waxes, lanolin wax, montan wax, ozokerites, hydrogenated oils, for instance hydrogenated jojoba oil or waxes obtained from the copolymerization of ethylene, waxes obtained by Fischer-Tropsch synthesis, fatty acid esters and glycerides that are solid at 45° C., silicone waxes, for instance alkyl, alkoxy and/or esters of poly(di)methylsiloxane that are solid at 45° C., containing from 10 to 45 carbon atoms, and certain fatty acids, for instance stearic acid, myristic acid or behenic acid, and mixtures thereof.

[0084] The wax may represent from 0.01% to 10% by weight and especially from 0.1% to 5% by weight relative to the total weight of the composition. According to one embodiment, the composition may be free of waxes.

[0085] For the purposes of the invention, the term "pasty compound" means a compound with a melting point ranging from 25° C. to 60° C. and preferably from 30° C. to 45° C., and having a hardness ranging from 0.001 to 0.5 MPa and preferably from 0.005 to 0.4 MPa.

[0086] Examples of pasty fatty substances that may be mentioned include PDMSs with pendent chains of the alkyl or alkoxy type containing from 8 to 24 carbon atoms, for instance stearyl dimethicone, and especially those sold by DOW CORNING under the references DC2503 or DC05514; esters of fatty alcohol or of fatty acid containing from 20 to 25 carbon atoms (a melting point especially from 20° C. to 35° C. and/or a viscosity at 40° C. ranging from 0.1 to 40 Pa.s), for instance cholesterol esters such as hydroge-

nated triglycerides of plant origin, for instance the hydrogenated castor oil sold under the name "Thixinr" by the company RHEOX, polyvinyl laurate, arachidyl propionate, triisostearyl or cetyl citrate, PVP/eicosene copolymer; isopropyl lanolins with a viscosity from 10 to 25 Pa.s and preferably from 19 to 25 Pa.s and/or a melting point of 25° C. to 45° C., and mixtures thereof.

[0087] The composition of the invention may also comprise at least one alkyl, alkoxy or phenyl dimethicone, for instance the product sold under the name "Abil wax 2440®" by the company GOLDSCHMIDT.

[0088] Aqueous Phase

[0089] The composition according to the invention comprises at least one aqueous phase containing water. The water may be a floral water such as cornflower water and/or a mineral water such as eau de VITTEL, eau de LUCAS or eau de LA ROCHE POSAY and/or a spring water.

[0090] This aqueous phase may also comprise organic solvents that are miscible with water (at 25° C.), for instance the primary alcohols such as ethanol and isopropanol, glycols such as glycerol, propylene glycol, butylene glycol, dipropylene glycol, diethylene glycol, glycol ethers, such as C₁-C₄ alkyl ethers of mono-, di- or tripropylene glycol, or mono-, di- or triethylene glycol, and mixtures thereof.

[0091] The aqueous phase may also comprise stabilizers, for example sodium chloride, magnesium dichloride and magnesium sulphate.

[0092] The aqueous phase may also comprise any water-soluble or water-dispersible compound that is compatible with an aqueous phase, such as gelling agents, film-forming polymers, thickeners and surfactants, and mixtures thereof.

[0093] According to one particular embodiment, the aqueous phase, and especially water, may be present in the composition according to the invention in a content ranging from 30% to 50% by weight and especially from 35% to 45% by weight relative to the total weight of the composition.

[0094] Thickener

[0095] The emulsion according to the invention may also comprise a fatty-phase thickener. The thickener may be chosen from:

[0096] organomodified clays, which are clays treated with compounds chosen especially from quaternary amines and tertiary amines. Organomodified clays that may be mentioned include organomodified bentonites, such as those sold under the name "Bentone 34" by the company RHEOX and organomodified hectorites such as those sold under the names "Bentone 27" and "Bentone 38" by the company RHEOX;

[0097] hydrophobic fumed silica, which is a fumed silica chemically surface-modified by chemical reaction generating a decrease in the number of silanol groups. It is especially possible to substitute silanol groups with hydrophobic groups.

[0098] The hydrophobic groups may be:

[0099] trimethylsiloxy groups, which are obtained especially by treating fumed silica in the presence of

hexamethyldisilazane. Silicas thus treated are known as "silica silylate" according to the CTFA (6th edition, 1995). They are sold, for example, under the references "AEROSIL R812®" by the company DEGUSSA and "CAB-O-SIL TS-530®" by the company CABOT;

[0100] dimethylsilyloxy or polydimethylsiloxane groups, which are obtained especially by treating fumed silica in the presence of polydimethylsiloxane or dimethyldichlorosilane. Silicas thus treated are known as "silica dimethyl silylate" according to the CTFA (6th edition, 1995). They are sold, for example, under the references "AEROSIL R972®" and "AEROSIL R974®" by the company DEGUSSA and "CAB-O-SIL TS-610®" and "CAB-O-SIL TS-720®" by the company CABOT.

[0101] The fumed silica preferably has a particle size that may be nanometric to micrometric, for example ranging from about 5 to 200 nm.

[0102] The fatty-phase thickener may be present in a content ranging from 0.1% to 5% by weight and especially from 0.4% to 3% by weight relative to the total weight of the composition.

[0103] Fillers

[0104] The composition according to the invention may also comprise at least one additional filler other than the polymethyl methacrylate powders.

[0105] The term "filler" means any colourless particle chosen from mineral or organic, lamellar, spherical or oblong fillers, which is chemically inert in the composition.

[0106] Mention may be made of talc, mica, silica, kaolin, polyamide powders, for instance Nylon® powder, poly-β-alanine powder and polyethylene powder, powders of tetrafluoroethylene polymers (Teflon®), lauroyllysine, starch, boron nitride, hollow polymer microspheres such as those of polyvinylidene chloride/acrylonitrile, such as Expancel® (NOBEL INDUSTRIE), acrylic polymer particles, especially of acrylic acid copolymer, for instance Polytrap® (DOW CORNING), polyurethane powders, silicone resin microbeads (for example Tospearls® from TOSHIBA), precipitated calcium carbonate, dicalcium phosphate, magnesium carbonate and magnesium hydrocarbonate, hydroxyapatite, hollow silica microspheres (Silica Beads® from MAPRECOS), glass or ceramic microcapsules, metal soaps derived from organic carboxylic acids containing from 8 to 22 carbon atoms and preferably from 12 to 18 carbon atoms, for example zinc stearate, magnesium stearate or lithium stearate, zinc laurate and magnesium myristate, and mixtures thereof. These fillers may or may not be surface-treated, especially to make them lipophilic.

[0107] The fillers may be present in the composition according to the invention in a content ranging from 0.1% to 10% by weight and especially from 0.1% to 7% by weight relative to the total weight of the composition.

[0108] Dyestuffs

[0109] The composition may advantageously contain at least one dyestuff, which may be chosen from the lipophilic dyes, hydrophilic dyes, pigments and nacs usually used in cosmetic or dermatological compositions, and mixtures

thereof. This dyestuff is generally present in a proportion of from 0.01% to 40% by weight, especially from 1% to 35% by weight, in particular from 2% to 25% by weight and more particularly from 3% to 20% by weight relative to the total weight of the composition.

[0110] The liposoluble dyes are, for example, Sudan Red, DC Red 17, DC Green 6, β -carotene, soybean oil, Sudan Brown, DC Yellow 11, DC Violet 2, DC Orange 5 and quinoline yellow. They may represent from 0.1% to 20% by weight and in particular from 0.1% to 6% by weight relative to the total weight of the composition.

[0111] The pigments may be white or coloured, mineral and/or organic, and coated or uncoated. Among the mineral pigments that may be mentioned are titanium dioxide, optionally surface-treated, zirconium oxide or cerium oxide, and also iron oxide or chromium oxide, manganese violet, ultramarine blue, chromium hydrate and ferric blue. Among the organic pigments that may be mentioned are carbon black, pigments of D&C type, and lakes based on cochineal carmine, barium, strontium, calcium or aluminium. The pigments may represent from 0.1% to 40% by weight, especially from 1% to 35% by weight and in particular from 2% to 25% by weight relative to the total weight of the composition.

[0112] The nacreous pigments may be chosen from white nacreous pigments such as mica coated with titanium or with bismuth oxychloride, coloured nacreous pigments such as titanium mica with iron oxides, titanium mica especially with ferric blue or with chromium oxide, titanium mica with an organic pigment of the abovementioned type and also nacreous pigments based on bismuth oxychloride. They may represent from 0.1% to 20% by weight and in particular from 0.1% to 15% by weight relative to the total weight of the composition.

[0113] Advantageously, the emulsion according to the invention comprises hydrophobic-coated pigments. The hydrophobic-coated pigments are pigments (such as those mentioned above) that are surface-treated with a hydrophobic agent to make them compatible with the fatty phase of the emulsion, especially so that they have good wettability with the oils of the fatty phase, such that these treated pigments are satisfactorily dispersed in the fatty phase.

[0114] The hydrophobic treatment agent may be chosen from silicones, for instance methicones, dimethicones or perfluoroalkylsilanes; fatty acids, for instance stearic acid; metal soaps, for instance aluminium dimyristate, the aluminium salt of hydrogenated tallow glutamate, perfluoroalkyl phosphates, perfluoroalkylsilanes, perfluoroalkyl-silazanes, polyhexafluoropropylene oxides, polyorganosiloxanes comprising perfluoroalkyl perfluoropolyether groups, and amino acids; N-acylamino acids or salts thereof; lecithin, isopropyl triisostearyl titanate, and mixtures thereof.

[0115] The N-acylamino acids may comprise an acyl group containing from 8 to 22 carbon atoms, for instance a 2-ethylhexanoyl, caproyl, lauroyl, myristoyl, palmitoyl,

stearoyl or cocoyl group. The salts of these compounds may be the aluminium, magnesium, calcium, zirconium, zinc, sodium or potassium salts. The amino acid may be, for example, lysine, glutamic acid or alanine.

[0116] The term "alkyl" mentioned in the hydrophobic agents mentioned above especially denotes an alkyl group containing from 1 to 30 carbon atoms and preferably containing from 5 to 16 carbon atoms.

[0117] Hydrophobic-treated pigments are especially described in patent application EP-A-1 086 683.

[0118] Rheology

[0119] Advantageously, the composition according to the invention may have a viscosity, measured at 25° C., at a shear rate of 200 min⁻¹ (200 rpm, i.e. a frequency of 50 Hz), ranging from 0.15 to 0.6 Pa.s (1.5 to 6 poises) and especially ranging from 0.25 to 0.45 Pa.s (2.5 to 4.5 poises). Such a viscosity allows easy application of the emulsion and allows a homogeneous, uniform, mark-free makeup effect to be obtained. The viscosity is measured at 25° C. using a CONTRAVES TV viscometer equipped with a No. 2 spindle, the measurement being performed after spinning the spindle for 10 minutes (after which time stabilization of the viscosity and of the spin speed of the spindle are observed), at a shear rate of 200 min⁻¹.

[0120] Additives

[0121] The composition of the invention may also comprise any additional additive usually used in the field under consideration, such as antioxidants, preserving agents, neutralizers, lipophilic gelling agents, aqueous-phase gelling agents, dispersants, cosmetic active agents, fragrances, free-radical scavengers, sequestering agents and film-forming agents, and mixtures thereof. These additives may be present in the composition in a proportion of from 0.0005% to 20% by weight and in particular from 0.001% to 10% by weight relative to the total weight of the composition.

[0122] As cosmetic active agents that may be used in the invention, mention may be made of vitamins A, E, C, B₃ and F, provitamins, for instance D-panthenol, calmatives, for instance α -bisabolol, aloe vera and allantoin, plant extracts or essential oils, protective or restructuring agents, for instance ceramides, "refreshing" active agents, for instance menthol and its derivatives, emollients, moisturizers, anti-wrinkle active agents, essential fatty acids and sunscreens, and mixtures thereof.

[0123] Needless to say, a person skilled in the art will take care to select the optional additional additives and/or the amount thereof such that the advantageous properties of the composition according to the invention are not, or are not substantially, adversely affected by the envisaged addition.

[0124] The composition according to the invention may be manufactured by the known processes generally used in cosmetics.

[0125] The composition according to the invention may be a skin makeup composition, for instance a foundation, a

concealer product, a tinted cream, a body makeup composition, and in particular a foundation to be applied to the face and/or the neck.

EXAMPLE

[0126] The example given below is presented as a non-limiting illustration of the field of the invention.

Example 1

[0127]

Foundation formulation	% by weight
1,3-butylene glycol	10.00
hectorite modified with distearyldimethylammonium chloride (sold under the name BENTONE 38 V by ELEMENTIS)	1.60
preserving agents	0.90
water qs	100.00
cyclopentadimethylsiloxane	11.36
isostearyl neopentanoate	0.50
sodium chloride	0.70
isododecane	13.00
cyclohexadimethylsiloxane	8.00
polydimethylsiloxane (DC 200 fluid 5 cSt sold by DOW CORNING)	2.00
cetyl dimethicone copolyol (sold under the name Abil EM90 by GOLDSCHMIDT)	0.80
polyglyceryl isostearate	0.60
isoëicosane	2.00
hexyl laurate	0.60
hollow polymethyl methacrylate microspheres (sold under the name COVABEAD LH85 by WACKHERR)	2.00
polymethyl methacrylate powder (sold under the name JURYMER MB1 by NIHON JUNYAKU)	2.00
oxyethylenated polydimethylsiloxane (sold under the name KF-6017 from SHIN-ETSU)	4.48
nacl	1.00
yellow iron oxide coated with perfluoroalkyl phosphate, as a dispersion in decamethylcyclopentasiloxane/dimethicone copolyol (sold under the name FA50DYF by KOBO)	2.40
brown iron oxide coated with perfluoroalkyl phosphate, as a dispersion in cyclomethicone/dimethyl polysiloxane copolyol (sold under the name FA50DRF by KOBO)	0.93
black iron oxide coated with perfluoroalkyl phosphate, as a dispersion in decamethylcyclopentasiloxane/dimethicone copolyol (sold under the name FA65DBF by KOBO)	0.44
alumina-treated titanium oxide coated with perfluoroalkyl phosphate, in decamethylcyclopentasiloxane/dimethicone copolyol (sold under the name FA65DF by KOBO)	9.54

[0128] This foundation applies easily to the skin, is found to have advantageous slip qualities on the skin, and can be worked easily so as to distribute the makeup uniformly on the face.

1. Fluid cosmetic composition in the form of a water-in-oil emulsion comprising a liquid fatty phase, an aqueous phase and a dimethicone copolyol, characterized in that it comprises solid particles of polymethyl methacrylate and in that the liquid fatty phase comprises isododecane, the said composition being free of cyclotetrasiloxane.

2. Fluid cosmetic composition in the form of a water-in-oil emulsion comprising a liquid fatty phase, an aqueous phase, a dimethicone copolyol and a C₈-C₂₂ alkyl dimethicone copolyol, characterized in that it comprises solid particles of polymethyl methacrylate and in that the liquid fatty phase comprises a volatile hydrocarbon-based oil, the said composition being free of cyclotetrasiloxane.

3. Composition according to either of claims 1 and 2, characterized in that the solid polymethyl methacrylate particles have a density ranging from 0.3 to 0.95, especially from 0.45 to 0.80 and more particularly from 0.5 to 0.75.

4. Composition according to one of the preceding claims, characterized in that it comprises at least two polymethyl methacrylates that are different in terms of density.

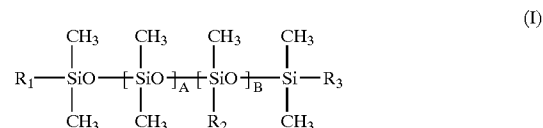
5. Composition according to any one of the preceding claims, characterized in that it combines two types of polymethyl methacrylate particles whose difference in density is at least 0.12, especially at least 0.15, in particular at least 0.18 and more particularly at least 0.22.

6. Composition according to either of claims 4 and 5, characterized in that the polymethyl methacrylate particles are present in weight proportions ranging, respectively, from 40% to 60% by weight, especially from 45% to 55% and in particular from 48% to 52% relative to the total weight of polymethyl methacrylates.

7. Composition according to claim 6, characterized in that the content of polymethyl methacrylate of higher density is predominant over the content of polymethyl methacrylate of lower density.

8. Composition according to any one of the preceding claims, characterized in that it comprises from 1% to 10% by weight, especially from 2% to 7% by weight and more particularly from 2.5% to 5.5% by weight of polymethyl methacrylate relative to the total weight of the the said composition.

9. Composition according to any one of claims 1 to 8, characterized in that the dimethicone copolyol is a compound of formula (I) below:



in which:

R₁, R₂ and R₃, independently of each other, represent a C₁-C₆ alkyl radical or a radical —(CH₂)_x—(OCH₂CH₂)_y—(OCH₂CH₂CH₂)_z—OR₄, at least one radical R₁, R₂ or R₃ not being an alkyl radical, R₄ being a hydrogen, a C₁-C₃ alkyl radical or a C₂-C₄ acyl radical;

A is an integer ranging from 0 to 200;

B is an integer ranging from 0 to 50; with the condition that A and B are not simultaneously equal to 0;

x is an integer ranging from 1 to 6;

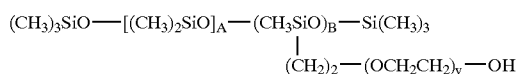
y is an integer ranging from 1 to 30; and

z is an integer ranging from 0 to 5.

10. Composition according to claim 9, characterized in that R₁=R₃=methyl radical, x is an integer ranging from 2 to 6 and y is an integer ranging from 4 to 30.

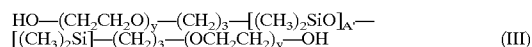
11. Composition according to claim 9 or 10, characterized in that R₄ is a hydrogen atom.

12. Composition according to any one of claims 9 to 11, characterized in that the dimethicone copolyol is a compound of formula (II) below:



in which A is an integer ranging from 20 to 105, B is an integer ranging from 2 to 10 and y is an integer ranging from 10 to 20.

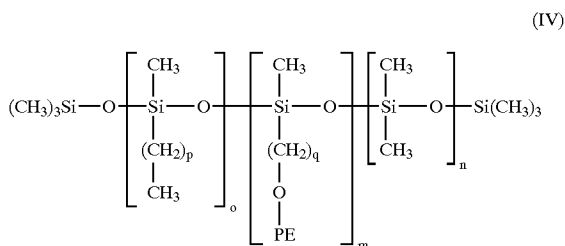
13. Composition according to claim 9, characterized in that the dimethicone copolyol is a compound of formula (III) below:



in which A' and y are integers ranging from 10 to 20.

14. Composition according to any one of claims 9 to 13, characterized in that the dimethicone copolyol is present in a content ranging from 5% to 10% by weight, preferably ranging from 5% to 8% by weight and preferentially ranging from 5% to 7% by weight, relative to the total weight of the composition.

15. Composition according to any one of claims 2 to 14, characterized in that the C₈-C₂₂ alkyl dimethicone copolyol is a compound of formula (IV) below:



in which:

PE represents $(\text{—C}_2\text{H}_4\text{O})_x(\text{—C}_3\text{H}_6\text{O})_y\text{—R}$, R being chosen from a hydrogen atom and an alkyl radical containing from 1 to 4 carbon atoms, x ranging from 0 to 100 and y ranging from 0 to 80, x and y not simultaneously being 0;

m ranging from 1 to 40;

n ranging from 10 to 200;

o ranging from 1 to 100;

p ranging from 7 to 21; and

q ranging from 0 to 4.

16. Composition according to claim 15, characterized in that R=H; m=1 to 10; n=10 to 100; o=1 to 30; p=15 and q=3.

17. Composition according to any one of claims 2 to 16, characterized in that the C₈-C₂₂ alkyl dimethicone copolyol is cetyl dimethicone copolyol.

18. Composition according to any one of claims 2 to 17, characterized in that the C₈-C₂₂ alkyl dimethicone copolyol is present in a content ranging from 0.5% to 2% by weight and in particular ranging from 0.5% to 1.5% by weight relative to the total weight of the composition.

19. Composition according to any one of claims 2 to 18, characterized in that the hydrocarbon-based volatile oil is

chosen from linear or branched hydrocarbon-based volatile oils containing from 8 to 16 carbon atoms.

20. Composition according to claim 19, characterized in that the volatile hydrocarbon-based oil is chosen from isododecane, isohexadecane and isohexyl neopentanoate, and mixtures thereof.

21. Composition according to any one of the preceding claims, characterized in that the volatile hydrocarbon-based oil, and especially isododecane, represents from 5% to 25%, especially from 10% to 20% and in particular from 10% to 15% by weight relative to the total weight of the composition.

22. Composition according to any one of the preceding claims, characterized in that the isododecane or the volatile hydrocarbon-based oil is combined with at least one distinct additional volatile oil chosen from hydrocarbon-based oils, fluoro oils and/or silicone oils optionally comprising alkyl or alkoxy groups, which are pendent or at the end of a silicone chain.

23. Composition according to claim 22, characterized in that the silicone oil is a linear, branched or cyclic silicone oil with a viscosity at room temperature of less than 8 mm²/s and containing from 2 to 7 silicon atoms.

24. Composition according to claim 22 or 23, characterized in that the silicone oil is chosen from octamethylcyclotetrasiloxane, decamethylcyclopentasiloxane, dodecamethylcyclohexasiloxane, heptamethylhexyltrisiloxane, heptamethyloctyltrisiloxane, hexamethyldisiloxane, octamethyltrisiloxane, decamethyltetrasiloxane and dodecamethylpentasiloxane, and mixtures thereof.

25. Composition according to any one of claims 22 to 24, characterized in that the additional volatile oil represents from 20% to 32%, especially from 20% to 30% and more particularly from 22% to 26% by weight relative to the total weight of the composition.

26. Composition according to any one of the preceding claims, characterized in that the composition also comprises at least one non-volatile oil.

27. Composition according to claim 26, characterized in that the non-volatile oil is chosen from hydrocarbon-based oils of mineral or synthetic origin, oils of animal origin, hydrocarbon-based oils of plant origin with a high triglyceride content consisting of fatty acid esters of glycerol, fatty acid esters, in particular containing from 4 to 22 carbon atoms, synthetic esters of formula R₁COOR₂ in which R₁ represents a linear or branched higher fatty acid residue containing from 7 to 40 carbon atoms and R₂ represents a branched hydrocarbon-based chain containing from 3 to 40 carbon atoms, hydroxylated esters, esters of aromatic acids and of alcohol containing from 4 to 22 carbon atoms, C₈ to C₂₆ higher fatty acids, C₈ to C₂₆ higher fatty alcohols, synthetic ethers containing at least 7 carbon atoms, silicone oils, polysiloxanes modified with fatty acids, fatty alcohols or polyoxyalkylenes, liquid fluorosilicones, and caprylic/capric acid triglycerides, and mixtures thereof.

28. Composition according to claim 26 or 27, characterized in that it comprises 0.1% to 12% and especially 1% to 5% of at least one non-volatile oil, relative to the total weight of the composition.

29. Composition according to any one of the preceding claims, characterized in that it comprises at least one wax, at least one gum and/or at least one pasty fatty substance, which is silicone-based or non-silicone-based, of plant, animal, mineral or synthetic origin.

30. Composition according to any one of the preceding claims, characterized in that it comprises 0.01% to 10% by weight and especially 0.1% to 5% by weight of at least one wax relative to the total weight of the composition.

31. Composition according to any one of the preceding claims, characterized in that it comprises a thickener for the liquid fatty phase.

32. Composition according to claim 31, characterized in that the thickener is chosen from organomodified clays and hydrophobic fumed silica.

33. Composition according to claim 31 or **32**, characterized in that the fatty-phase thickener is present in a content ranging from 0.1% to 5% by weight and especially from 0.4% to 3% by weight relative to the total weight of the composition.

34. Composition according to any one of the preceding claims, characterized in that the aqueous phase comprises at least one water-miscible organic solvent and/or stabilizers and/or at least one water-soluble or water-dispersible compound.

35. Composition according to any one of the preceding claims, characterized in that the said aqueous phase is present in a proportion of from 30% to 50% by weight and especially from 35% to 45% by weight relative to the total weight of the composition.

36. Composition according to any one of the preceding claims, characterized in that it also comprises at least one additional filler different from the polymethyl methacrylate powders.

37. Composition according to the preceding claim, characterized in that this filler is present in a proportion of from 0.1% to 10% by weight and in particular from 0.1% to 7% by weight relative to the total weight of the composition.

38. Composition according to any one of the preceding claims, characterized in that it also comprises a dyestuff chosen from lipophilic dyes, hydrophilic dyes, pigments and nacres.

39. Composition according to claim 38, characterized in that the pigments are hydrophobic-coated pigments.

40. Composition according to claim 38 or **39**, characterized in that this dyestuff is present in a proportion of from 0.01% to 40% by weight, especially from 1% to 35% by weight, in particular from 2% to 25% by weight and more particularly from 3% to 20% by weight relative to the total weight of the composition.

41. Composition according to any one of the preceding claims, characterized in that it is in the form of a skin makeup composition and in particular a fluid foundation.

42. Process for making up the skin, characterized in that it comprises the application to the skin of at least one composition according to any one of the preceding claims.

* * * * *