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

(19) World Intellectual Property Organization
International Bureau

(43) International Publication Date
16 January 2014 (16.01.2014)

WIPO | PCT

(10) International Publication Number
WO 2014/009140 A2

(51) International Patent Classification: Not classified

(21) International Application Number:
PCT/EP2013/063151

(22) International Filing Date:
24 June 2013 (24.06.2013)

(25) Filing Language: English

(26) Publication Language: English

(30) Priority Data:
2012-154664 10 July 2012 (10.07.2012) JP

(71) Applicant: **WACKER CHEMIE AG** [DE/DE]; Hanns-Seidel-Platz 4, 81737 München (DE).

(72) Inventor: **IGARASHI, Kenji**; 2-13-14 Matsushiro, Tsukuba-shi, Ibaraki 305-0035 (JP).

(74) Agents: **MIESKES, Klaus** et al.; Wacker Chemie AG, Hanns-Seidel-Platz 4, 81737 München (DE).

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

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

Published:

— *without international search report and to be republished upon receipt of that report (Rule 48.2(g))*

WO 2014/009140 A2

(54) Title: SILICONE EMULSION COMPOSITION FOR BATH AGENT

(57) Abstract: Provided is an organopolysiloxane composition for a bath agent in which an organopolysiloxane is allowed to be uniformly and effectively adsorbed to the skin while a relatively low concentration of the organopolysiloxane is used in bath water, thereby imparting a feel of the organopolysiloxane. An oil-in-water emulsion composition containing a cationic polymer having an imidazolinium group or a quaternary ammonium group in its structure, a polyorganosiloxane which serves as an oily component of a bath agent as well as a feel imparting component, and a surfactant is used for a bath agent.

SILICONE EMULSION COMPOSITION FOR BATH AGENT

TECHNICAL FIELD

The present invention relates to a silicone emulsion composition which is used for a skin care cosmetic material such as a bath agent to exert a feel-imparting function. In the present invention, a bath agent may include a body soap, a body lotion, and a bath agent directly added to bath water, which are used during bathing. In particular, the present invention relates to a silicone emulsion composition which can be used for a bath agent directly added to bath water to impart a silky feel, a film feel, and the like, to the skin after bathing.

BACKGROUND ART

Addition of a cationic polymer and various oily components to a bath agent has been conventionally proposed to impart a feel during and after bathing. For example, Patent Literature 1 proposes that a cationic polymer, an oily component, and a nonionic surfactant are contained in a bath agent. Thus, a moist feel and a smooth feel can be given after bathing. Patent Literature 2 describes that a cationic polymer having a certain particle diameter is added to give a slimy feel as if taking a natural hot spring and a moist feel after bathing. It is known that a so-called organopolysiloxane such as silicone is used for various cosmetic materials to give a unique silky feel. Also in Patent Literature 1, a silicone oil

is exemplified as one of various oily components. To exert effects of an organopolysiloxane as a feel-imparting component of a bath agent, it is necessary to use the silicone oil in a relatively high concentration like common oily components. When an organopolysiloxane is used as a feel-imparting component for a bath agent, it is difficult to provide a feel-imparting effect by decreasing the amount of a feel-imparting component to be used, that is, in a state where the concentration of a feel-imparting component in bath water is low. Therefore, there are problems such as dirt of a bathtub and an oily component floated on the surface of bath water caused by a high concentration of oily components in the bath water, and local stickiness caused by non-uniform adhesion of oily components to the skin due to the oily components floated on the surface of bath water.

CITATION LIST

PATENT LITERATURES

Patent Literature 1: Japanese Patent Application Laid-Open No. Hei. 2-115115

Patent Literature 2: Japanese Patent Application Laid-Open No. Hei. 9-315951

SUMMARY OF INVENTION

TECHNICAL PROBLEM

In view of such a situation, an object of the present invention is to provide an emulsion composition for a bath agent which is allowed to be uniformly and effectively adsorbed to a skin while a relatively low concentration of an organopolysiloxane is used in bath water, thereby imparting a feel of the organopolysiloxane, and can solve various problems by using a high concentration of the oily component.

SOLUTION TO PROBLEM

The present inventors have intensively investigated to solve the problems, and as a result, found that a particular cationic polymer, an organopolysiloxane as an oily component, and a surfactant are used to prepare an oil-in-water emulsion, and thus a good feel due to the organopolysiloxane is obtained during and after bathing. Thus, the present invention has been completed.

Accordingly, the present invention is as follows:

[1] an oil-in-water emulsion composition for a bath agent, comprising a cationic polymer having an imidazolinium group or a quaternary ammonium group in its structure,

an organopolysiloxane having a siloxane unit represented by the formula (1):

$(R^1R^2R^3SiO_{1/2})_a(R^4R^5SiO_{2/2})_b(R^6SiO_{3/2})_c(SiO_{4/2})_d$ (1)

wherein R^1 to R^6 may be the same or different, and may each represent a hydrogen atom, a substituted or unsubstituted

monovalent hydrocarbon group having 1 to 30 carbon atoms, or a hydroxy group,

and a, b, c, and d each represent a ratio of mole number of each unit, and satisfy $a + b + c + d = 1$, $0 \leq a \leq 1$, $0.2 \leq b \leq 1$, $0 \leq c \leq 0.7$, and $0 \leq d \leq 0.7$),

and a surfactant.

[2] the oil-in-water emulsion composition for a bath agent according to [1], wherein the cationic polymer is one or more kinds selected from a cationic guar gum derivative, a cationic cellulose derivative, and a cationic starch derivative.

[3] the oil-in-water emulsion composition for a bath agent according to [1] or [2], wherein a, b, c, and d in the formula (1) representing the organopolysiloxane satisfy $a + b + c + d = 1$, $0 \leq a \leq 0.5$, $0.5 \leq b \leq 1$, $0 \leq c \leq 0.3$, and $0 \leq d \leq 0.3$.

[4] a bath agent using the oil-in-water emulsion composition according to any one of [1] to [3].

ADVANTAGEOUS EFFECTS OF INVENTION

The oil-in-water emulsion composition according to the present invention can be efficiently adsorbed to a skin to effectively impart a feel due to an organopolysiloxane since the emulsion particles contain a cationic polymer. Therefore, the

composition of the present invention can be used for a bath agent to give a silky feel, a refreshing feel, and a film feel, specific to an organopolysiloxane to the skin, and impart a good water draining property when a shower is taken after bathing. In order to obtain sufficient effect in conventional techniques, it is necessary to add an organopolysiloxane as an oily component to bath water in a concentration more than 100 ppm. However, to obtain the same effect in the present invention, an organopolysiloxane is added in a concentration of about 10 ppm. Accordingly, admixture of an oily component in a bath agent approaches practical application in terms of production cost and admixture design in view of stability, when compared with the conventional techniques. Further, this can suppress dirt of a bathtub and an oily component floated on the surface of bath water caused by a high concentration of oily components in the bath water, and non-uniform adhesion to the skin due to the oily components floated on the surface of bath water.

DESCRIPTION OF EMBODIMENTS

It is necessary that the cationic polymer which is an essential component of the oil-in-water emulsion composition of the present invention should have an imidazolium group or a quaternary ammonium group in the structure. This is because the imidazolium group or quaternary ammonium group has an

action of affinity to keratin tissues such as a skin which is negatively charged and thus exerts a high adsorption effect. The polymer structure and molecular weight of the cationic polymer used in the present invention are not limited as long as the cationic polymer can be used for cosmetics. The basic skeleton of the polymer may be generally an inorganic polymeric skeleton such as an organopolysiloxane, in addition to a widely known organic polymeric skeleton. The cationic polymer of the present invention may be a mixture of various cationic polymers. In order to obtain an emulsion composition with an organopolysiloxane and allow it to be efficiently adsorbed to keratin tissues such as a skin, it is suitable that the cationic polymer of the present invention is a polymer having a polysaccharide skeleton such as a cationic cellulose derivative, a cationic starch derivative, and a cationic guar gum derivative, or a copolymer of a vinyl monomer having an imidazolium group or a quaternary ammonium group, for example, dimethyldiallyl ammonium chloride or methylvinyl imidazolium chloride, and (meth)acrylamide, alkyl or dialkyl (meth)acrylamide, alkyl (meth)acrylate, vinylcaprolactam, or vinylpyrrolidone. In the latter group, polymers known as "polyquaternium" in the market have been confirmed to have safety for application to human body as a cosmetic material. Therefore, for example, polyquaternium-6, -7, -11, -16, -28, -44, -46, and -61 are suitable.

Among these cationic polymers, examples of available cationic polymers may include O-[2-hydroxy-3-(trimethylammonio)propyl]hydroxyethylcellulose chloride (trade name: CATINAL HA-100, available from TOHO CHEMICAL INDUSTRY Co., Ltd.) as a cationic cellulose derivative, starch hydroxypropyl trimonium chloride (trade name: SENSOMER CI-50, available from Nalco Company) as a cationic starch derivative, O-[2-hydroxy-3-(trimethylammonio)propyl] guar gam chloride (trade name: JAGUAR C13S, or JAGUAR C15, JAGUAR C16, JAGUAR C17, or JAGUAR C162, available from Rhodia Inc.) as a cationic guar gum derivative, and a copolymer of dimethyldiallyl ammonium chloride and acrylamide (trade name: ME polymer 09W, available from TOHO CHEMICAL INDUSTRY Co., Ltd.).

From the viewpoints of the adsorption effect of the organopolysiloxane during bathing, the cationic polymer is more preferably selected from a cationic cellulose derivative, a cationic starch derivative, and a cationic guar gum derivative, or may be a mixture thereof.

The amount of cationic polymer to be contained in the oil-in-water emulsion composition of the present invention is 0.1 to 2% by weight, and more preferably 0.5 to 1.5% by weight. When the amount is less than 0.1% by weight, adsorption of the organopolysiloxane is poor. When it is more than 2% by weight, the adsorption of the organopolysiloxane is favorable, but

thickening is significant. Accordingly, the emulsion composition is difficult to be handled.

The organopolysiloxane which is another essential component of the oil-in-water emulsion composition of the present invention has a siloxane unit represented by the formula (1), and may have a mixture of siloxane units.

$(R^1R^2R^3SiO_{1/2})_a(R^4R^5SiO_{2/2})_b(R^6SiO_{3/2})_c(SiO_{4/2})_d$ (1)

In the formula (1), R^1 to R^6 may be the same or different, and each be selected from a hydrogen atom, a substituted or unsubstituted monovalent hydrocarbon group having 1 to 30 carbon atoms, and a hydroxy group, and a, b, c, and d each represent a ratio of mole number of each unit, and satisfy $a + b + c + d = 1$, $0 \leq a \leq 1$, $0.2 \leq b \leq 1$, $0 \leq c \leq 0.7$, and $0 \leq d \leq 0.7$.

The organopolysiloxane of the present invention may be a single polymer or a mixture of polymers. When the organopolysiloxane is a mixture, a, b, c, and d in the formula (1) each are a composition ratio of siloxane units of average of the mixture. The organopolysiloxane used in the present invention is preferably a linear organopolysiloxane in which a D unit ($R^4R^5SiO_{2/2}$) is a main component, as a single polymer or a mixture of polymers. Further, the organopolysiloxane may contain a T unit ($R^6SiO_{3/2}$) having a three-dimensional cross-linking structure and a Q unit ($SiO_{4/2}$). The ratio of number of

such a unit is preferably $0 \leq a \leq 0.5$, $0.5 \leq b \leq 1$, $0 \leq c \leq 0.3$, and $0 \leq d \leq 0.3$. When b is less than 0.5, it is difficult to obtain a silky feel specific to an organopolysiloxane as a linear component. When c and d each are more than 0.3, the amount of the organopolysiloxane to be contained as a linear component is relatively small. For this reason, it is difficult to obtain a silky feel. Therefore, this is not preferable.

The organopolysiloxane used in the present invention can be used alone or two or more kinds of organopolysiloxanes having a different composition or different viscosity may be used in combination. The viscosity range thereof at 25°C is preferably 10 to 100,000 mPa·s, and more preferably 100 to 50,000 mPa·s. When the viscosity is less than 10 mPa·s, the volatility of the organopolysiloxane is high, and therefore the organopolysiloxane does not remain on the skin, and the particular feel is hardly obtained. When the viscosity is equal to, or more than, 100,000 mPa·s, the silky feel due to the organopolysiloxane is hardly obtained, and the stability of the emulsion is poor. When the organopolysiloxane used in the present invention is a mixture of organopolysiloxanes each having a different viscosity, the viscosity of the contained organopolysiloxane at 25°C may be 1 to 70,000,000 mPa·s as long as the mixture has such a composition that the viscosity of the mixture falls within the above-mentioned range and the

rate of volatilization of the organopolysiloxane from the mixture is not excess.

In the formula (1) of the present invention, R^1 to R^6 may be the same or different. In the same structural unit, for example, in the $(R^4R^5SiO_{2/2})$ structural unit, R^4 may be a methyl group, and R^5 may be simultaneously different, that is, may simultaneously include a methyl group, a phenyl group, and a hydrogen atom. A structure to link between respective units may be different from the structures of the units.

Examples of a monovalent hydrocarbon group capable of being selected as R^1 to R^6 may include a linear or branched alkyl or alkenyl group having 1 to 30 carbon atoms, a cycloalkyl or cycloalkenyl group having 5 to 25 carbon atoms, an aralkyl or aryl group having 6 to 25 carbon atoms, and substituted forms thereof. As a substituent, a halogen atom, a hydroxyl group, an alkoxy group, an acyloxy group, a ketoxymate group, an amino group, an amide group, an aminoxy group, a mercapto group, an alkenyloxy group, an acid anhydride group, a carbonyl group, saccharides, and a cyano group can be selected.

Preferable examples of the monovalent hydrocarbon group of R^1 to R^6 may include a linear or branched alkyl group such as a methyl group, an ethyl group, a propyl group, an isopropyl group, a n-butyl group, an isobutyl group, a tert-butyl group, a pentyl group, an isopentyl group, a neopentyl group, a hexyl group, an isohexyl group, a heptyl group, an isoheptyl group,

an octyl group, an isooctyl group, a nonyl group, a decyl group, and an octadecyl group, an alkenyl group such as a vinyl group, an allyl group, a butenyl group, and a pentenyl group, a cycloalkyl group such as a cyclopentyl group, a cyclohexyl group, a cycloheptyl group, a cyclooctyl group, a dicyclopentyl group, and a decahydronaphtyl group, a cycloalkenyl group such as a cyclopentenyl group (including 1-, 2-, and 3-forms), and a cyclohexenyl group (including 1-, 2-, and 3-forms), and an aralkyl group and an aryl group such as a phenyl group, a naphthyl group, a tetrahydronaphthyl group, a tolyl group, and an ethylphenyl group.

The organopolysiloxane of the present invention can be produced by a method known to a person skilled in the art. Specific examples of a preferable organopolysiloxane may include a dimethylpolysiloxane, a phenyl-modified dimethylpolysiloxane, an alkylaralkyl-modified polysiloxane, a fluorine-modified dimethylpolysiloxane, an amino-modified dimethylpolysiloxane, an amino-modified polyether-modified dimethylpolysiloxane, an amide-modified dimethylpolysiloxane, various terminal-reactive dimethylpolysiloxanes, a dimethylpolysiloxane wax, a trimethylsiloxy silicic acid (composed of M and Q units of $(R^1R^2R^3SiO_{1/2})_a$), a polymethylsilsesquioxane, a polyphenylsilsesquioxane, and a stearoxymethylpolysiloxane. In the single organopolysiloxane or mixture thereof, a, b, c, and d in the formula (1) which

each represent a composition ratio of siloxane units may fall within a certain range. Among them, a linear or branched dimethylpolysiloxane, a mixture of the dimethylpolysiloxane and a trimethylsiloxy silicic acid, or a phenyl-modified dimethylpolysiloxane is particularly preferably used for the composition for a bath agent of the present invention, or a mixture thereof may be used.

The amount of the organopolysiloxane to be contained as an essential component of the oil-in-water emulsion composition of the present invention is 3 to 90% by weight, and preferably 5 to 70% by weight, based on the oil-in-water emulsion composition. When the amount is less than 3% by weight, the feel due to the organopolysiloxane component is not imparted sufficiently. When it is more than 90% by weight, the viscosity of the emulsion is significantly high. Accordingly, the emulsion composition is difficult to be handled.

The surfactant used in the present invention is not particularly limited as long as it can be used for cosmetics. Specific examples thereof may include a nonionic surfactant such as a polyoxyethylene alkyl ether, a polyoxyethylene-hydrogenated castor oil, a polyoxyethylene fatty acid ester, a polyoxyethylene sorbitan fatty acid ester, a sorbitan fatty acid ester, and a fatty acid monoglyceride; a cationic surfactant such as a C8-C24 alkyltrimethylammonium salt, and a

di(C8-C24 alkyl)dimethylammonium salt; an anionic surfactant such as an alkyl or alkenyl sulfate salt, an ethylene oxide and/or propylene oxide-added alkyl or alkenyl ether sulfate salt, an olefin sulfonate salt, an alkanesulfonate salt, a saturated or unsaturated fatty acid salt, an ester of α-sulfofatty acid salt, an amino acid-type surfactant, a phosphate ester-type surfactant, and a taurine-type surfactant; and an amphoteric surfactant including a sulfonic acid-type amphoteric surfactant and a betaine-type amphoteric surfactant. As the surfactant of the present invention, a nonionic surfactant such as a polyoxyethylene alkyl ether and a polyoxyethylene-hydrogenated castor oil is preferably used since the bath water does not foam during addition of the bath agent to the bath water and a stable emulsification state is maintained.

As the surfactant of the present invention, one or more kinds thereof can be used if necessary. The amount of the surfactant to be used is preferably 0.5 to 15% by weight, and particularly preferably 2 to 10% by weight since the bath water does not foam during addition of the bath agent to the bath water.

In addition, the oil-in-water emulsion composition of the present invention can contain a pH adjustor, a refreshing agent, an antioxidant, a chelating agent, an absorption

promoter, an inorganic powder, another surfactant, a preservative, a perfume, and a coloring agent, if necessary, without impairing the effects of the present invention.

The emulsion composition of the present invention can be prepared by a known method, which is not particularly limited. Specifically the emulsion can be prepared by mixing a cationic polymer, an organopolysiloxane, a surfactant, purified water, and other components and emulsifying the mixture by a commonly used mixer suitable for production of an emulsion, such as a homogenizer, a colloid mill, a homomixer, and a high-speed stator rotor mixer.

Preferable examples of preparation of the emulsion composition of the present invention may include a phase inversion emulsification method. In the phase inversion emulsification method, an organopolysiloxane, a surfactant, water in a small amount, for example, in the same amount as the surfactant, and a cationic polymer are mixed and stirred by a stirrer to prepare a water-in-oil emulsion. A small amount of water is further added to the emulsion, and the mixture is stirred by a high-speed stator rotor mixer to convert the phases into an oil-in-water system. The system is then diluted with water to an arbitrary concentration, to obtain an oil-in-water emulsion.

In the phase inversion emulsification method, a cationic polymer may be added to a water-in-oil emulsion formed of an

organopolysiloxane, a surfactant, and a small amount of water, before phase inversion.

The phase inversion emulsification method is preferable since the particle diameter of emulsion is easily adjusted by the stirring speed or the like during phase inversion of a water-in-oil emulsion to an oil-in-water emulsion. When a water-in-oil emulsion is prepared at the early stage of emulsification, the stirring condition is not particularly limited, and if necessary, an anchor mixer, a four-bladed propeller, a homogenizer, a colloid mill, a homomixer, or a high-speed stator rotor mixer may be used.

The oil-in-water emulsion composition of the present invention can be contained as a feel-imparting component of a bath agent together with other components of the bath agent, and a method for producing the same is not particularly limited. When it is added to a bath agent, a usual mixer such as a propeller stirrer, a turbine stirrer, a puddle stirrer, an anchor stirrer, a homomixer stirrer, a homodisper stirrer, a homogenizer stirrer, and an agi homomixer stirrer can be used.

EXAMPLES

Hereinafter, Examples of the present invention will be described in detail, but the present invention is not limited to the following Examples. In Examples, a method for preparing

an emulsion and a bathing test will be as follows. All viscosities are values at 25°C.

<Method for preparing emulsion>

<Emulsions A to J>

An organopolysiloxane component, a surfactant, purified water in the same amount as the surfactant, and a cationic polymer, as shown in Table 1, were added and stirred at 500 rpm for 5 minutes by a four-bladed propeller, to prepare a water-in-oil emulsion. The emulsion was stirred at 3,000 rpm for 5 minutes by ULTRA-TURRAX T 50 basic and shaft generator G45G, manufactured by IKA. The emulsion was diluted with the rest of purified water shown in Table 1, and stirred for 5 minutes, to prepare emulsions A to I according to the present invention, which each were an oil-in-water emulsion. An emulsion J shown in Table 1, but not according to the present invention, was prepared in the same manner as in the cases of the emulsions A to I except for using no cationic polymer. Numerical values of components in Table 1 are based on parts by weight thereof.

As the organopolysiloxane, a dimethylpolysiloxane, a phenyl-modified dimethylpolysiloxane, or a trimethylsiloxy silicic acid was used. A dimethylpolysiloxane having only a dimethylsiloxy group (D unit) blocked with a trimethylsiloxy group (M unit) at its terminal was used. Four types

dimethylpolysiloxanes of which viscosities were 10 mPa·s, 350 mPa·s, 300,000 mPa·s, and 30,000,0000 mPa·s, respectively, were used. A phenyl-modified polydimethylsiloxane having a terminal blocked with a trimethylsiloxy group (M unit), and a trifunctional phenylsiloxy group (T unit) containing dimethylsiloxy (D unit) as a main unit was used. The viscosity thereof was 1,000 Pa·s.

JAGUAR C13S (trade name, available from Rhodia Inc) was used as a cationic guar gam derivative, CATINAL HA-100 (trade name) was used as a cationic cellulose derivative, SESOMER CI-50 (trade name, available from Nalco Company) was used as a cationic starch derivative, and ME polymer 09W (trade name, available from TOHO CHEMICAL INDUSTRY Co., Ltd.) was used as a copolymer of dimethyldiallylammonium and acrylamide.

As a surfactant, a polyoxyethylene-hydrogenated castor oil having a mole number of added ethylene oxide of 200, BLAUNON CW200 (trade name, available from AOKI OIL INDUSTRIAL CO., LTD.), was used.

[Table 1]

		Emulsion A	Emulsion B	Emulsion C	Emulsion D	Emulsion E	Emulsion F	Emulsion G	Emulsion H	Emulsion I	Emulsion J
Dimethyl polysiloxane	10 mPa·s		20	34		30	25	20	20	20	20
	350 mPa·s	40									
	3×10^5 mPa·s		20					20	20	20	20
	3×10^7 mPa·s			6			5				
Phenyl-modified dimethylpolysiloxane					40						
Trimethylsiloxy silicic acid						10	10				
JAGUAR C13S		1	1	1	1	1	1				
CATINAL HA-100								1			
SESOMER CI-50									1		
ME POLYMER 09W										1	
BLAUNON CW200		3	3	3	3	3	3	3	3	3	3
Purified water		56	56	56	56	56	56	56	56	56	57
Total		100	100	100	100	100	100	100	100	100	100

<Bathing Test>

An emulsion or a mixture was added to bath water in a volume of 200 L at 40°C so as to have a predetermined concentration, and bathing was performed for 10 minutes. A slimy feel of bath water, a water draining property of shower, a silky feel of a skin immediately after the bathing, and a silky feel of the skin after drying, and a film feel to the skin were examined. Evaluation was performed according to the criterion shown below.

<Evaluation>

Equivalent to hot water: 0 points

Slightly better than hot water: 1 point

Better than hot water: 2 points

Remarkably better than hot water: 3 points

<Examples>

Table 2 shows the results of the bathing test using the prepared organopolysiloxane emulsions A to J as well as the concentrations of the emulsions in bath water. The emulsion compositions obtained by emulsifying the organopolysiloxane(s) with the cationic guar gum derivative all had a favorable silky feel immediately after bathing and after drying, when compared with hot water (Examples 1 to 11). In Examples 3, 4, 7, and 8 in which the emulsion B, E, or F, which contains dimethylpolysiloxane having a D unit as a main unit in a high degree of polymerization, was used, the evaluation points of 4

items except for sliminess of bath water were higher than those in other Examples. Further, Example 8 using the emulsion F containing a trimethylsiloxy silicic acid having an M unit and a Q unit as a main unit showed the highest evaluation point in a water draining property of shower at a concentration lower than Example 4, a silky feel of a skin after drying, and a film feel to the skin.

[Table 2]

		Example 1	Example 2	Example 3	Example 4	Example 5	Example 6	Example 7	Example 8	Example 9	Example 10	Example 11
Used emulsion		A	B	B	B	C	D	E	F	G	H	I
Concentration of emulsion in bath water (ppm)		25	10	25	50	25	25	25	25	25	25	25
Concentration of organopolysiloxane in bath water (ppm)		10	4	10	20	10	10	10	10	10	10	10
Concentration of cationic polymer in bath water (ppm)		0,25	0,1	0,25	0,5	0,25	0,25	0,25	0,25	0,25	0,25	0,25
Evaluation	Sliminess of bath water	1	0	1	1	1	1	1	1	3	2	1
	Water draining property of shower	1	1	2	3	2	1	2	3	2	2	1
	Silky feel of skin immediately after bathing	2	1	2	3	2	2	2	2	2	2	2
	Silky feel of skin after drying	2	2	2	3	2	2	3	3	2	2	2
	Film feel to skin	2	1	3	3	2	2	2	3	1	1	1

<Comparative Examples>

In order to investigate addition of organopolysiloxane not according to the present invention, a dimethylpolysiloxane, a polyoxyethylene-hydrogenated castor oil, a cationic guar gam derivative, and purified water in the same composition as in the emulsion B of Table 1 were stirred at 500 rpm by a four-bladed propeller to prepare a mixture. The obtained mixture was added to bath water so that the concentration thereof was 25 ppm. Many oily components floated on the surface of bath water were observed. It was difficult to uniformly diffuse the mixture. Further, the organopolysiloxane did not uniformly adhere to the skin surface, and undesired stickiness was observed in adhesion parts. Therefore, this mixture was not evaluated. In Comparative Examples, the emulsion J of the organopolysiloxane not according to the present invention (Comparative Example 1), a bath agent using the emulsion J and a 1% by weight cationic polymer aqueous solution (Comparative Examples 2 to 6), and a 1% by weight cationic polymer aqueous solution (Comparative Examples 7 to 10) were subjected to the bathing test. Table 3 shows the evaluation results thereof. In Comparative Examples 1 to 6, the effects of the organopolysiloxane (silky feel, and water draining property of shower) were not obtained, but a slimy feel of bath water was obtained. The degree of slimy feel was equal to that in a test adding only a 1% by weight cationic polymer aqueous solution (Comparative Examples 7 to 10).

[Table 3]

		Comparative Example 1	Comparative Example 2	Comparative Example 3	Comparative Example 4	Comparative Example 5	Comparative Example 6	Comparative Example 7	Comparative Example 8	Comparative Example 9	Comparative Example 10
Used material Concentration in bath water	Emulsion J	25 ppm	25 ppm	50 ppm	25 ppm	25 ppm	25 ppm				
	1wt% aq. solution of JAGUAR C13S		25 ppm	50 ppm				25 ppm			
	1wt% aq. solution of CATINAL HA-100				25 ppm				25 ppm		
	1wt% aq. solution of SESOMER CI-50					25 ppm				25 ppm	
	1wt% aq. solution of ME POLYMER 09W						25 ppm				25 ppm
Concentration of organopolysiloxane in bath water (ppm)		10	10	20	10	10	10	10	10	10	10
Concentration of cationic polymer in bath water (ppm)		0.25	0.25	0.5	0.25	0.25	0.25	0.25	0.25	0.25	0.25
Evaluation	Sliminess of bath water	0	1	1	3	2	1	1	3	2	1
	Water draining property of shower	0	0	0	0	0	0	0	0	0	0
	Silky feel of skin immediately after bathing	0	0	0	0	0	0	0	0	0	0
	Silky feel of skin after drying	0	0	0	0	0	0	0	0	0	0
	Film feel to skin	0	0	0	0	0	0	0	0	0	0

CLAIMS

1. An oil-in-water emulsion composition for a bath agent, comprising:

- a cationic polymer having an imidazolinium group or a quaternary ammonium group in its structure;

- an organopolysiloxane having a siloxane unit represented by the formula (1):

$(R^1R^2R^3SiO_{1/2})_a(R^4R^5SiO_{2/2})_b(R^6SiO_{3/2})_c(SiO_{4/2})_d$ (1)

wherein R^1 to R^6 may be the same or different, and may each represent a hydrogen atom, a substituted or unsubstituted monovalent hydrocarbon group having 1 to 30 carbon atoms, or a hydroxy group,

and a, b, c, and d each represent a ratio of mole number of each unit, and satisfy $a + b + c + d = 1$, $0 \leq a \leq 1$, $0.2 \leq b \leq 1$, $0 \leq c \leq 0.7$, and $0 \leq d \leq 0.7$;

- and a surfactant.

2. The oil-in-water emulsion composition for a bath agent according to claim 1, wherein the cationic polymer is one or more kinds selected from a cationic guar gum derivative, a cationic cellulose derivative, and a cationic starch derivative.

3. The oil-in-water emulsion composition for a bath agent

according to claim 1 or 2, wherein a, b, c, and d in the formula (1) representing the organopolysiloxane satisfy $a + b + c + d = 1$, $0 \leq a \leq 0.5$, $0.5 \leq b \leq 1$, $0 \leq c \leq 0.3$, and $0 \leq d \leq 0.3$.

4. A bath agent using the oil-in-water emulsion composition according to any one of claims 1 to 3.