

[Description]**[Title of Invention]**

MULTIPLE EMULSION COMPOSITION HAVING IMPROVED STABILITY

[Technical Field]

The present specification describes a multiple emulsion composition having improved stability.

[Background Art]

Emulsion cosmetic formulations can impart moisturizing power to the skin together with smooth feeling of use, and examples thereof may include general emulsion types such as oil-in-water (O/W) and water-in-oil (W/O) types and multiple emulsion types containing a multiple phase.

Multiple emulsion type emulsion compositions are emulsion compositions having a multiple phase containing three or more phases such as a water-in-oil-in-water (W/O/W) type emulsion composition containing an outer water phase, an oil phase, and an inner water phase and an oil-in-water-in-oil (O/W/O) emulsion composition containing an outer oil phase, a water phase, and an inner oil phase. Multiple emulsion compositions are likely to cause an aggregation, fusion, phase inversion, or creaming phenomenon of emulsion particles as compared with general emulsion compositions. Hence, various measures for securing the stability of multiple emulsion compositions have been studied.

As conventional stabilization methods of multiple emulsion compositions, a method in which an increase in osmotic pressure in the inner phase is induced by the addition of a salt (FIG. 1) or the viscosity of the inner

phase is increased by use of fatty alcohols, waxes, nonionic thickening agents, and the like, a method in which a multiple emulsion composition is stabilized by increasing the viscosity through thickening of outer phase portion, and the like have been proposed. In the case of such methods, thickening of oil used in the inner/outer phases may be difficult and it is difficult to add a salt at a certain concentration or more in the case of salt addition, and as a result, it is difficult to prevent aggregation or fusion of emulsion particles. In a case in which such an aggregation or fusion phenomenon occurs, the viscosity/hardness of the formulation decrease over time and the formulation is separated. In addition, it is difficult to stabilize the formulation in a case in which the viscosity of the formulation is low.

[Summary of Invention]

[Technical Problem]

In an aspect, a problem to be solved by the present invention is to provide a multiple emulsion composition having improved stability.

In another aspect, a problem to be solved by the present invention is to provide a stabilized multiple emulsion composition which does not cause a phenomenon such as aggregation, fusion, phase inversion, or creaming.

In still another aspect, a problem to be solved by the present invention is to provide an emulsion composition which is stable at a low viscosity as well as at a high viscosity, regardless of the viscosity.

In still another aspect, a problem to be solved by the present invention is to provide a multiple emulsion composition having improved stability without separately comprising a salt, a thickening agent, or a surfactant in

an excess amount.

In still another aspect, a problem to be solved by the present invention is to provide a multiple emulsion composition having excellent safety to the skin and excellent stability over time.

In still another aspect, a problem to be solved by the present invention is to provide a multiple emulsion composition providing soft and excellent feel of use.

In still another aspect, a problem to be solved by the present invention is to provide a multiple emulsion composition which maintains stability at the time of manufacture, distribution, and use.

In still another aspect, a problem to be solved by the present invention is to provide a multiple emulsion composition having a low viscosity so as to provide light feel of use.

[Solution to Problem]

In an aspect, the present invention relates to a multiple emulsion composition comprising three or more phases, in which two adjacent phases have opposite charges.

[Advantageous Effects of Invention]

In an aspect, the present invention can provide a multiple emulsion composition having improved stability.

In another aspect, the present invention can provide a stabilized multiple emulsion composition which does not cause a phenomenon such as aggregation, fusion, phase inversion, or creaming.

In still another aspect, the present invention can provide an emulsion composition which is stable at a low viscosity as well as at a high viscosity, regardless of the viscosity.

In still another aspect, the present invention can provide a multiple emulsion composition having improved stability without separately comprising a salt, a thickening agent, or a surfactant in an excess amount.

In still another aspect, the present invention can provide a multiple emulsion composition having excellent safety to the skin and excellent stability over time.

In still another aspect, the present invention can provide a multiple emulsion composition providing soft and excellent feel of use.

In still another aspect, the present invention can provide a multiple emulsion composition which maintains stability at the time of manufacture, distribution, and use.

In still another aspect, the present invention can provide a multiple emulsion composition having a low viscosity so as to provide light feel of use.

[Brief Description of Drawings]

FIG. 1 is a diagram illustrating a method of inducing an increase in osmotic pressure in an inner phase as an example of a conventional method of stabilizing a multiple emulsion formulation.

FIG. 2 is a diagram illustrating the configuration of a W/O/W emulsion composition as an example of the configuration of a multiple emulsion composition according to an embodiment of the present invention.

FIG. 3 is a brief diagram illustrating an example of a method of preparing a multiple emulsion composition.

FIG. 4 is a photograph for confirming the stability of compositions of Examples and Comparative Examples.

FIG. 5 is a photomicrograph (400-fold magnification) for confirming emulsion particles of a composition of Example 1.

FIG. 6 is a photomicrograph (400-fold magnification) for confirming emulsion particles of a composition of Comparative Example 1.

FIG. 7 is a photomicrograph (400-fold magnification) for confirming emulsion particles of a composition of Comparative Example 2.

FIG. 8 is a photomicrograph (200-fold magnification) for confirming emulsion particles of a composition of Example 2 immediately after preparation.

FIG. 9 is a photomicrograph (200-fold magnification) for confirming emulsion particles of a composition of Example 2 after being maintained at 25°C for one week.

FIG. 10 is a photomicrograph (200-fold magnification) for confirming emulsion particles of a composition of Comparative Example 3 immediately after preparation.

[Description of Embodiments]

Hereinafter, embodiments of the present invention will be described in more detail. However, the techniques disclosed in this application are not limited to the embodiments described herein but may be embodied in other forms. It should be understood, however, that the embodiments disclosed herein are provided so that this disclosure will be thorough and complete, and will fully convey the scope of the invention to those skilled in the art. In addition, those skilled in the art will appreciate that various modifications, additions and substitutions are possible, without departing from the scope and spirit of the invention as disclosed in the accompanying claims.

In an embodiment of the present invention, a multiple emulsion composition in which two adjacent phases have opposite charges is provided.

The multiple emulsion composition may comprise a multiple phase comprising three or more phases, and the multiple phase may comprise two or more phases among a water phase, an oil phase, and a silicone phase. The multiple phase means that emulsion particles are formed again in other emulsion particles. Examples of multiple emulsion composition may comprise, but are not limited to, triple phases such as W/O/W, W/S/W, O/W/O, S/W/S, S/W/O, O/W/S and quadruple phases such as W/O/W/O and O/W/O/W.

In the composition, the interface may be stabilized by the interaction between charges caused by the opposite charges of adjacent phases, and thus an aggregation, fusion, or creaming phenomenon of emulsion particles can be prevented in the multiple emulsion composition.

All phases of the composition may comprise an ionic material, and the ionic material may comprise a cationic or anionic material which exhibits a charge.

In the composition, two adjacent phases may comprise ionic materials having opposite charges to each other and thus the adjacent phases may exhibit opposite charges. For example, in the case of a W/O/W composition, the outer water phase may comprise an anionic material, the oil phase may comprise a cationic material, and the inner water phase may comprise an anionic material, as illustrated in FIG. 2. In addition, it is sufficient if the charges of the ionic materials in the adjacent phases are opposite to each other, and thus the water phase may comprise a cationic material and the oil phase may comprise an anionic material. Further, as long as the charge of the ionic material is opposite to that in the adjacent phase, the cationic or anionic materials comprised in the outer and inner water phases may be the same material or different materials.

Since two adjacent phases comprise ionic materials

having opposite charges to each other, the two phases exhibit opposite charges and charge interaction is exhibited at the interface between the two phases. As illustrated in FIG. 2, a zone (denoted by "ion charge interaction zone" in the drawing) exhibiting charge interaction is formed at the interface, a layer which surrounds the interface is formed in this zone, and thus the stability of the formulation can be improved.

As described above, the stabilization is achieved through the interaction between charges, and it is thus possible to form a stable emulsion composition without using a surfactant, a thickening agent, and the like that may cause a problem in the safety of formulation in an excess amount and to provide a composition having excellent skin safety with respect to the subject of use of the composition.

As the cationic material, any material may be used as long as it exhibits a positive charge, but examples thereof may comprise an emollient or thickening agent having a positive charge, and for example, a compound containing an amine group may be comprised.

The compound containing an amine group may be, for example, a compound having $-N=$, $-NH-$, $-NH_2$, and the like as a functional group. Examples thereof may comprise, but are not limited to, one or more selected from an aliphatic amine compound, an aromatic amine compound, or an amine group-containing silicone compound. The compound containing an amine group may be, for example, an alkylamine containing a linear or branched alkyl group having 6 to 30 carbon atoms, an aliphatic amine compound such as an alkanolamine containing a linear or branched alkanol group having 6 to 30 carbon atoms, an aromatic amine compound such as aniline, o-toluidine, 2,4,6-trimethylaniline, anisidine, or N-methylaniline, and an

amine group-containing silicone-based compound such as bis amodimethicone, amodimethicone, or aminopropyl dimethicone. The compound containing an amine group may be, for example, one or more selected from hexyldecyl myristoyl methylaminopropionate, bis amodimethicone, amodimethicone, or aminopropyl dimethicone.

As the anionic material, any material may be used as long as it exhibits a negative charge, but examples thereof may comprise an emollient or thickening agent having a negative charge and an anionic polymer compound.

The anionic polymer compound may be, for example, a polymer compound having a carboxylic acid group, a sulfonic acid group, a sulfuric acid ester group, and a phosphoric acid ester group as a functional group. Examples thereof may comprise, but are not limited to, one or more selected from an acrylic acid-based polymer compound, a polysaccharide polymer compound, or a sulfonic acid-based polymer compound. The anionic polymer compound may be, for example, an acrylic acid-based polymer compound such as polyacrylic acid, polymethacrylic acid, polymethyl methacrylic acid, a methyl methacrylate-acrylic acid copolymer, a vinyl pyrrolidone-acrylic acid copolymer, a hydroxyethyl acrylate/sodium acryloyldimethyl taurate copolymer, an acrylate/C10-30 alkyl acrylate crosspolymer, or carbomer, a polysaccharide polymer compound such as alginic acid, pectin, or polygalacturonic acid, or a sulfonic acid-based polymer compound such as polystyrene sulfonic acid. For example, one or more selected from a hydroxyethyl acrylate/sodium acryloyldimethyl taurate copolymer, an acrylate/C10-30 alkyl acrylate crosspolymer, or carbomer may be used.

The ionic material may be comprised in an amount of 0.1 wt% to 20 wt% based the total weight of the

composition. The content of the ionic material may be, for example, 0.1 wt% or more, 0.2 wt% or more, 0.3 wt% or more, 0.4 wt% or more, 0.5 wt% or more, 0.6 wt% or more, 0.7 wt% or more, 0.8 wt% or more, 0.9 wt% or more, 1 wt% or more, 1.5 wt% or more, 2 wt% or more, 2.5 wt% or more, 3 wt% or more, 3.5 wt% or more, 4 wt% or more, 4.5 wt% or more, 5 wt% or more, 5.5 wt% or more, 6 wt% or more, 6.5 wt% or more, 7 wt% or more, 7.5 wt% or more, 8 wt% or more, 8.5 wt% or more, 9 wt% or more, or 10 wt% or more and 20 wt% or less, 19 wt% or less, 18 wt% or less, 17 wt% or less, 16 wt% or less, 15 wt% or less, 14 wt% or less, 13 wt% or less, 12 wt% or less, 11 wt% or less, 10 wt% or less, 9 wt% or less, or 8 wt% or less. The stability of the composition may be excellent and the skin safety may be excellent when the content of the ionic material is within the above range.

In a specific example, the ionic material may be comprised in an amount of 0.1 wt% to 20 wt% based on the total weight of the phase comprising the ionic material. The content of the ionic material may be, for example, 0.1 wt% or more, 0.2 wt% or more, 0.3 wt% or more, 0.4 wt% or more, 0.5 wt% or more, 0.6 wt% or more, 0.7 wt% or more, 0.8 wt% or more, 0.9 wt% or more, 1 wt% or more, 1.5 wt% or more, 2 wt% or more, 2.5 wt% or more, 3 wt% or more, 3.5 wt% or more, 4 wt% or more, 4.5 wt% or more, 5 wt% or more, 5.5 wt% or more, 6 wt% or more, 6.5 wt% or more, 7 wt% or more, 7.5 wt% or more, 8 wt% or more, 8.5 wt% or more, 9 wt% or more, or 10 wt% or more and 20 wt% or less, 19 wt% or less, 18 wt% or less, 17 wt% or less, 16 wt% or less, 15 wt% or less, 14 wt% or less, 13 wt% or less, 12 wt% or less, 11 wt% or less, 10 wt% or less, 9 wt% or less, or 8 wt% or less. The stability of the composition may be excellent and the skin safety may be excellent when the content of the ionic material is

within the above range.

When the two adjacent phases are referred to as a first phase and a second phase, the ionic materials comprised in the first and second phases may be comprised to such an extent that the charges in the adjacent two phases are opposite to each other and a layer can be thus formed through charge interaction. The weight ratio of the ionic material comprised in the first phase to the ionic material comprised in the second phase may be appropriately adjusted depending on the charges of the ionic materials comprised in the respective phases. For example, the weight ratio of the ionic material comprised in the first phase to the ionic material comprised in the second phase may be 1 : 10 to 10 : 1.

Since it is not required to stabilize the composition according to the present embodiment through separate thickening, it is possible to provide a composition having a viscosity in a wide range, regardless of the viscosity. The composition may have a viscosity of, for example, 1000 cps or more, 1100 cps or more, 1200 cps or more, 1300 cps or more, 1400 cps or more, 1500 cps or more, 1600 cps or more, 1700 cps or more, 1800 cps or more, 1900 cps or more, 2000 cps or more, 2100 cps or more, 2200 cps or more, 2300 cps or more, 2400 cps or more, 2500 cps or more, 2600 cps or more, 2700 cps or more, 2800 cps or more, 2900 cps or more, or 3000 cps or more and 30000 cps or less, 29000 cps or less, 28000 cps or less, 27000 cps or less, 26000 cps or less, 25000 cps or less, 24000 cps or less, 23000 cps or less, 22000 cps or less, 21000 cps or less, 20000 cps or less, 19000 cps or less, 18000 cps or less, 17000 cps or less, 16000 cps or less, 15000 cps or less, 14000 cps or less, 13000 cps or less, 12000 cps or less, 11000 cps or less, 10000 cps or less, 9900 cps or less, 9800

cps or less, 9700 cps or less, 9600 cps or less, 9500 cps or less, 9400 cps or less, 9300 cps or less, 9200 cps or less, 9100 cps or less, 9000 cps or less, 8900 cps or less, 8800 cps or less, 8700 cps or less, 8600 cps or less, 8500 cps or less, 8400 cps or less, 8300 cps or less, 8200 cps or less, 8100 cps or less, 8000 cps or less, 7900 cps or less, 7800 cps or less, 7700 cps or less, 7600 cps or less, 7500 cps or less, 7400 cps or less, 7300 cps or less, 7200 cps or less, 7100 cps or less, 7000 cps or less, 6900 cps or less, 6800 cps or less, 6700 cps or less, 6600 cps or less, 6500 cps or less, 6400 cps or less, 6300 cps or less, 6200 cps or less, 6100 cps or less, or 6000 cps or less. The viscosity may be, for example, 1,000 to 30,000 cps, 2,000 cps to 26,000 cps, or 4,000 cps to 25,000 cps.

FIG. 3 illustrates an example of a method of preparing a W/O/W emulsion composition as an example of the multiple emulsion composition according to the present embodiment. For example, a W/O/W emulsion composition may be prepared by preparing a W/O emulsion and then emulsifying the W/O emulsion prepared in a water phase and an O/W/O emulsion composition may be prepared by preparing an O/W formulation and then emulsifying the O/W formulation prepared in an oil phase. In an example, the W/O/W emulsion composition can be prepared by separately preparing a W/O emulsion composition and an O/W emulsion composition and then mixing and emulsifying the W/O emulsification composition and the O/W emulsion composition. The method of preparing the multiple emulsion composition according to the present embodiment is not limited to the methods described above and can be prepared by employing a method commonly known in the technical field.

In a specific example, the composition may further

comprise a surfactant for emulsification.

As the surfactant, any surfactant may be used without limitation as long as it is commonly used in the technical field. For example, surfactants used for W/O emulsification such as lauryl PEG-9 polydimethylsiloxylethyl dimethicone, cyclopentasiloxane*PEG-10 dimethicone* disteardimonium hectorite, and cetyl PEG.PPG-10/1 dimethicone (cetyl dimethicone copolyol), surfactants used for O/W emulsification such as arachidyl alcohol/beheryl alcohol/arachidyl glucoside, cetearyl alcohol*cetearyl glucoside, C14-22 alcohols*C12-20 alkyl glucoside, and glyceryl stearate*PEG-100 stearate, and the like may be used, but it is not limited thereto.

The surfactant may be comprised in an amount of 0.1 wt% to 20 wt% based on the total weight of the composition. The content of the surfactant may be, for example, 0.1 wt% or more, 0.2 wt% or more, 0.3 wt% or more, 0.4 wt% or more, 0.5 wt% or more, 0.6 wt% or more, 0.7 wt% or more, 0.8 wt% or more, 0.9 wt% or more, 1.0 wt% or more, 1.5 wt% or more, 2 wt% or more, 2.5 wt% or more, 3 wt% or more, 3.5 wt% or more, 4 wt% or more, 4.5 wt% or more, 5 wt% or more, 5.5 wt% or more, 6 wt% or more, 6.5 wt% or more, 7 wt% or more, 7.5 wt% or more, 8 wt% or more, 8.5 wt% or more, 9 wt% or more, or 10 wt% or more and 20 wt% or less, 19 wt% or less, 18 wt% or less, 17 wt% or less, 16 wt% or less, 15 wt% or less, 14 wt% or less, 13 wt% or less, 12 wt% or less, 11 wt% or less, 10 wt% or less, 9 wt% or less, or 8 wt% or less. In the present embodiment, it is possible to stabilize the emulsion formulation without comprising a surfactant in an excess amount.

In a specific example, the composition may be a cosmetic composition.

In embodiments of the present invention, the cosmetic composition may be formulated comprising a cosmetically or dermatologically acceptable medium or base. The cosmetic composition may be provided in all formulations suitable for topical application, and in the form of a suspension, a microemulsion, a microcapsule, a microgranule, or vesicles of ionic (liposome) and nonionic dispersants or in the form of a cream, a skin, a lotion, a powder, an ointment, a spray, or a concealer stick. The cosmetic composition may also be used in the form of foam or in the form of an aerosol composition further comprising a compressed propellant. These compositions may be prepared according to conventional methods in the art.

The cosmetic composition according to embodiments of the present invention may comprise adjuvants conventionally used in the field of cosmetics or dermatology, such as a fatty substance, an organic solvent, a solubilizer, a thickener, a gelling agent, an antioxidant, a suspending agent, a stabilizer, a foaming agent, a fragrance, water, an ionic or nonionic emulsifier, a nonionic emollient, a filler, a sequestering agent, a chelating agent, a preservative, a vitamin, a blocking agent, a wetting agent, an essential oil, a dye, a pigment, a hydrophilic or lipophilic active agent, a lipid vesicle, or arbitrary other ingredients commonly used in cosmetics. The adjuvants are introduced in amounts commonly used in the field of cosmetics or dermatology.

The cosmetic composition according to the embodiments of the present invention may further comprise a skin absorption promoting material in order to enhance the skin improving effect.

[Embodiments]

Hereinafter, the present invention will be described in detail with reference to Examples, Comparative Examples, and Test Examples. It will be apparent to those skilled in the art that these are merely illustrative examples of the present invention in order to more specifically explain the present invention and the scope of the present invention is not limited by these Examples, Comparative Examples, and Test Examples.

[Example 1 and Comparative Examples 1 and 2]

Preparation of W/O/W multiple emulsion composition

W/O/W multiple emulsion compositions were prepared according to the compositions (unit: wt%) presented in the following Table 1. A W/O emulsion composition and an O/W emulsion composition were each prepared, and then the W/O emulsion composition was mixed with the O/W emulsion composition and emulsified, thereby preparing a W/O/W multiple emulsion composition. In the present Example and Comparative Examples, a surfactant was used in an amount smaller than that of the surfactant usually used for the formation of a stable formulation, and the experiment was conducted under conditions in which a decrease in stability was accelerated.

[Table 1]

Ingredient			Compara tive Example 1	Compara tive Example 2	Example 1
Step 1: Preparation of W/O part					
Oil part	Squalane	Emollient	20	15	15
	Amodimethicone	Emollient (+) charge	0	5	5
	Cetyl PEG.PPG-10/1 dimethicone	w/o surfactant	2	2	2
Water part	Carbomer	Thickening agent	0.1	0	0.1

		(-) charge			
	Water	Solvent	To 100	To 100	To 100
Step 2: Preparation of O/W part					
Oil part	Squalane	Emollient	15	10	10
	Amodimethicone	Emollient (+) charge	0	5	5
	Arachidyl alcohol/behenyl alcohol/arachidyl glucoside	Surfactant	1.5	1.5	1.5
Water part	Carbomer	Thickening agent (-) charge	0.1	0	0.1
	Water	Solvent	To 100	To 100	To 100
Step 3: Preparation of W/O/W (W/O + O/W)					
W/O part (prepared in step 1)			15	15	15
O/W part (prepared in step 2)			85	85	85
Sum			100	100	100

[Example 2 and Comparative Examples 3 to 5]

Preparation of W/O/W multiple emulsion composition

W/O/W multiple emulsion compositions were prepared according to the compositions (unit: wt%) presented in the following Table 2. A W/O emulsion composition and an O/W emulsion composition were each prepared, and then the W/O emulsion composition was mixed with the O/W emulsion composition and emulsified, thereby preparing a W/O/W multiple emulsion composition. In the present Example and Comparative Examples, a surfactant was used in an amount smaller than that of the surfactant usually used for the formation of a stable formulation, and the experiment was conducted under conditions in which a decrease in stability was accelerated.

[Table 2]

Ingredient			Compa rativ e Examp le 3	Compa rativ e Examp le 4	Compa rativ e Examp le 5	Examp le 2
Step 1: Preparation of W/O part						
Oil part	Squalane	Emollient	20	20	15	15
	Bis amodimethicone	Emollient (+) charge	0	0	5	5
	Cyclopentasiloxane* PEG-10 dimethicone* disteardimonium hectorite	w/o surfactant	2	2	2	2
Water part	Water	Solvent	To 100	To 100	To 100	To 100
	Hydroxyethyl acrylate/sodium acryloyldimethyl taurate copolymer	Thickening agent (-) charge	0.1	0.1	0.1	0.1
Step 2: Preparation of O/W part						
Oil part	Squalane	Emollient	15	15	15	15
	Bis amodimethicone	Emollient (+) charge	5	5	5	5
	Arachidyl alcohol/behenyl alcohol/arachidyl glucoside	Surfactant	2	2	2	2
Water part	Hydroxyethyl acrylate/sodium acryloyldimethyl taurate copolymer	Thickening agent (-) charge	0	0.2	0	0.2
	Water	Solvent	To 100	To 100	To 100	To 100
Step 3: Preparation of W/O/W (W/O + O/W)						
W/O part (prepared in step 1)			15	15	15	15
O/W part (prepared in step 2)			85	85	85	85
Sum			100	100	100	100

[Example 3 and Comparative Examples 6 to 8]

Preparation of O/W/O multiple emulsion composition

O/W/O multiple emulsion compositions were prepared according to the compositions (unit: wt%) presented in

the following Table 3. An O/W emulsion composition and a W/O emulsion composition were each prepared, and then the O/W emulsion composition was mixed with the W/O emulsion composition and emulsified, thereby preparing an O/W/O multiple emulsion composition. In the present Example and Comparative Examples, a surfactant was used in an amount smaller than that of the surfactant usually used for the formation of a stable formulation, and the experiment was conducted under conditions in which a decrease in stability was accelerated.

[Table 3]

Ingredient			Compa rativ e Examp le 6	Compa rativ e Examp le 7	Compa rativ e Examp le 8	Examp le 3
Step 1: Preparation of O/W part						
Oil part	Squalane	Emollient	15	15	15	15
	Bis amodimethicone	Emollient (+) charge	5	5	5	5
	Arachidyl alcohol/behenyl alcohol/arachidyl glucoside	Surfactant	2	2	2	2
Water part	Hydroxyethyl acrylate/sodium acryloyldimethyl taurate copolymer	Thickening agent (-) charge	0	0.2	0	0.2
	Water	Solvent	To 100	To 100	To 100	To 100
Step 2: Preparation of W/O part						
Oil part	Squalane	Emollient	20	20	15	15
	Bis amodimethicone	Emollient (+) charge	0	0	5	5
	Cyclopentasiloxane* PEG-10 dimethicone* disteardimonium hectorite	w/o surfactant	2	2	2	2
Water part	Water	Solvent	To 100	To 100	To 100	To 100
	Hydroxyethyl acrylate/sodium	Thickening	0.1	0.1	0.1	0.1

	acryloyldimethyl taurate copolymer	agent (-) charge				
Step 3: Preparation of O/W/O (O/W + W/O)						
O/W part (prepared in step 1)			15	15	15	15
W/O part (prepared in step 2)			85	85	85	85
Sum			100	100	100	100

**[Test Example 1] Evaluation on appearance stability
of composition**

The compositions of the Examples and Comparative Examples were maintained at 25°C for one week and the stability of the compositions was evaluated. The evaluation results on the stability according to the appearance of the formulations after the elapse of one week are presented in Table 4 and FIG. 4.

[Table 4]

Division	Stability
Example 1	O (favorable)
Example 2	O (favorable)
Example 3	O (favorable)
Comparative Example 1	X (phase inversion)
Comparative Example 2	X (phase inversion)
Comparative Example 3	X (phase inversion)
Comparative Example 4	X (phase inversion)
Comparative Example 5	X (phase inversion)
Comparative Example 6	X (phase inversion)
Comparative Example 7	X (phase inversion)
Comparative Example 8	X (phase inversion)

From the results of FIG. 4 and Table 4, it can be seen that all the compositions of Examples have maintained favorable appearance, but all the compositions of Comparative Examples have undergone phase inversion.

It can be seen that particularly the composition of Example 1 have maintained a stable emulsion state even after the elapse of 24 hours, but the formulation of Comparative Example 1 which did not comprise an ionic material in the oil phase has undergone phase inversion before the elapse of 12 hours, the formulation of Comparative Example 2 which did not comprise an ionic material in the water phase has undergone phase inversion before the elapse of 24 hours, and these formulations are not stably maintained.

[Test Example 2] Observation of multiple emulsion particles

The stability of the compositions was evaluated by observing the multiple emulsion particles of the compositions of Examples and Comparative Examples described above.

The photomicrographs of emulsion particles of the compositions of Example 1, Comparative Example 1, and Comparative Example 2 observed immediately after preparation are illustrated in FIGS. 5 to 7, respectively. It can be seen that the composition of Example 1 is in a stable multiple emulsion state in which emulsion particles are distributed in other emulsion particles, but the compositions of Comparative Examples 1 and 2 do not form a multiple emulsion state and undergo coalescence of oil-phase particles.

The photomicrographs of emulsion particles of the composition of Example 2 observed immediately after preparation and after being maintained at 25°C for one week are illustrated in FIGS. 8 and 9, respectively. It can be seen that the state of multiple emulsion particles is stably maintained immediately after preparation and even after the elapse of one week. On the other hand, Comparative Example 3 of FIG. 10 can be seen that a

coalescence phenomenon of multiple emulsion particles has occurred even immediately after preparation and thus has failed to be stabilized.

[Claims]

[Claim 1]

A multiple emulsion composition comprising three or more phases, wherein two adjacent phases have opposite charges,

wherein all phases of the composition comprise an ionic material, wherein the ionic material is a cationic material or an anionic material,

wherein the two adjacent phases comprise ionic materials having opposite charges,

wherein the cationic material comprises one or more selected from hexyldecyl myristoyl methylaminopropionate, bis amodimethicone, amodimethicone, and aminopropyl dimethicone, and

wherein the anionic material comprises one or more selected from a hydroxyethyl acrylate/sodium acryloyldimethyl taurate copolymer, an acrylate/C10-30 alkyl acrylate crosspolymer, and carbomer.

[Claim 2]

The composition according to claim 1, wherein the ionic material is comprised at from 0.1 wt% to 20 wt% with respect to a total weight of the composition.

[Claim 3]

The composition according to claim 1, wherein the ionic material is comprised at from 0.1 wt% to 20 wt% with respect to a total weight of a phase comprising the ionic material.

[Claim 4]

The composition according to claim 1, wherein a weight ratio of an ionic material comprised in a first phase to an ionic material comprised in a second phase is

from 1 : 10 to 10 : 1 when the two adjacent phases are referred to as the first phase and the second phase.

[Claim 5]

The composition according to claim 1, wherein three or more phases of the composition are a water phase and one or more of an oil phase or a silicone phase.

[Claim 6]

The composition according to claim 1, wherein the composition is a W/O/W emulsion composition or O/W/O emulsion composition comprising three phases.

[Claim 7]

The composition according to claim 1, wherein the composition has a viscosity of from 1,000 cps to 30,000 cps.