DESCRIPTION

Title of Invention: OIL-IN-WATER EMULSION COMPOSITION

Technical Field

[0001]

The present invention relates to an oil-in-water emulsion composition and the like.

Background Art

[0002]

Oil-in-water (O/W) emulsion compositions having an aqueous phase as a continuous phase are widely used as creams, lotions, or the like because they have a good feeling of use when used as external compositions, such as cosmetics (e.g., PTL 1 to PTL 3 listed below).

[0003]

The stability of oil-in-water emulsion cosmetics is known to be affected by the particle size of oil droplet particles, the repulsive force between the oil droplet particles, and the viscosity of the continuous phase. For example, when the particle size of oil droplet particles is large, the oil layer and the aqueous phase become separated over time. Accordingly, in order to enhance the stability of the composition, for example, the particle size of oil droplet particles is reduced by a method using a high-pressure emulsifier, such as a homogenizer or a nanomizer, a D-phase emulsification method, or the like (see, for example, PTL 4 and PTL 5).

Citation List

Patent Literature

[0004]

PTL 1: JP2014-114230A

PTL 2: JP2015-059114A

PTL 3: JP2013-006790A

PTL 4: JP2006-089420A

PTL 5: JP2007-289074A

Summary of Invention

Technical Problem

[0005]

The present inventors conducted extensive research to develop an oil-in-water emulsion cosmetic comprising meadowfoam oil that is less sticky and that has a feeling of moisture retention and a feeling of emollient. However, there was a problem that when a water-soluble sucrose fatty acid ester and a glycerol mono-fatty acid ester were used as surfactants, uneven oil droplet particles with a large particle size and a wide particle size distribution width were formed.

[0006]

The present invention was made in order to solve the above problem. An object of the present invention is to provide an oil-in-water emulsion cosmetic comprising meadowfoam oil having uniform oil droplet particles with a small average particle size and a narrow particle size distribution width.

Solution to Problem

[0007]

As a result of extensive research to achieve the above object, the present inventors surprisingly found that an oil-in-water emulsion cosmetic having uniform oil droplet particles with a small average particle size and a narrow particle size distribution width can be prepared when a water-soluble sucrose fatty acid ester and a glycerol mono-fatty acid ester, as well as N-acylglutamic acid and/or a salt thereof, are used as surfactants. The present inventors have completed the present invention upon further studies based on this finding.

[0008]

Specifically, the present invention typically includes the main subjects described in the following items.

Item 1. An oil-in-water emulsion composition

comprising:

component (A): meadowfoam oil,

component (B): N-acylglutamic acid and/or a salt thereof,

component (C): a water-soluble sucrose fatty acid ester, and

component (D): a glycerol mono-fatty acid ester.

Item 2. The oil-in-water emulsion composition according to Item 1, wherein component (A) is contained in an amount of 1 to 20 mass% based on the total amount of the composition.

Item 3. The oil-in-water emulsion composition according to Item 1 or 2, wherein component (B) is contained in an amount of 0.05 to 0.5 mass% based on the total amount of the composition.

Item 4. The oil-in-water emulsion composition according to any one of Items 1 to 3, further comprising component (E): a higher alcohol.

Item 5. The oil-in-water emulsion composition according to any one of Items 1 to 4, further comprising component (F): hydrogenated lecithin.

Item 6. The oil-in-water emulsion composition according to any one of Items 1 to 5, wherein the average particle size of oil droplets is 1.0 to 2.0 μm.

Item 7. The oil-in-water emulsion composition according to any one of Items 1 to 6, wherein the standard deviation of the particle size distribution of oil droplets is 0.20 or less.

Item 8. The oil-in-water emulsion composition according to any one of Items 1 to 7, which is a cosmetic.

Advantageous Effects of Invention

[0009]

In the oil-in-water emulsion composition of the present invention, the oil droplet particles contained therein have a small particle size. Furthermore, the oil particles have a narrow particle size distribution width and are relatively uniformly present in the composition. Therefore, the oil-in-water emulsion composition of the present invention shows high stability over time. Accordingly, the oil-in-water emulsion composition of the present invention can be suitably used, for example, as a cosmetic.

Brief Description of Drawings

[0010]

Fig. 1 shows the analysis results of the particle size distribution of the oil-in-water emulsion cosmetic of Example 1.

Fig. 2 shows the analysis results of the particle size distribution of the oil-in-water emulsion cosmetic of Example 2.

Fig. 3 shows the analysis results of the particle size distribution of the oil-in-water emulsion cosmetic of Example 3.

Fig. 4 shows the analysis results of the particle size distribution of the oil-in-water emulsion cosmetic of Example 4.

Fig. 5 shows the analysis results of the particle size distribution of the oil-in-water emulsion cosmetic of Example 5.

Fig. 6 shows the analysis results of the particle size distribution of the oil-in-water emulsion cosmetic of Example 6.

Fig. 7 shows the analysis results of the particle size distribution of the oil-in-water emulsion cosmetic of Example 7.

Fig. 8 shows the analysis results of the particle size distribution of the oil-in-water emulsion cosmetic of Example 8.

Fig. 9 shows the analysis results of the particle size distribution of the oil-in-water emulsion cosmetic of Example 9.

Fig. 10 shows the analysis results of the particle size distribution of the oil-in-water emulsion cosmetic of Example 10.

Fig. 11 shows the analysis results of the particle size distribution of the oil-in-water emulsion cosmetic of Comparative Example 1.

Fig. 12 shows the analysis results of the particle size distribution of the oil-in-water emulsion cosmetic of Comparative Example 2.

Fig. 13 shows the analysis results of the particle size distribution of the oil-in-water emulsion cosmetic of Comparative Example 3.

Fig. 14 shows the analysis results of the particle size distribution of the oil-in-water emulsion cosmetic of Comparative Example 4.

Description of Embodiments

[0011]

The present invention is described in detail below.

[0012]

The oil-in-water emulsion composition of the present invention comprises:

component (A): meadowfoam oil,

component (B): N-acylglutamic acid and or a salt thereof,

component (C): a water-soluble sucrose fatty acid ester, and

component (D): a glycerol mono-fatty acid ester.

The oil-in-water emulsion composition of the present invention can be particularly suitably used as a cosmetic.

[0013]

The meadowfoam oil as component (A) is a fatty oil obtained from the seeds of meadowfoam (*Limnanthaceae alba*).

[0014]

The content of component (A) in the oil-in-water emulsion composition of the present invention is not limited within a range in which the feeling of moisture retention and the feeling of emollient of meadowfoam are exhibited. For example, the content of component (A) is about 1 to 20 mass%, preferably about 2.5 to 17.5 mass%, and more preferably about 5 to 17.5

mass%, based on the total amount of the composition.

[0015]

The N-acylglutamic acid as component (B) is a glutamic acid derivative having a structure in which the amino group of glutamic acid is substituted with an acyl group, and N-acylglutamate is a salt of the glutamic acid derivative. The acyl group in the N-acylglutamic acid is not limited, and is preferably an acyl group derived from a C_{8-24} saturated or unsaturated linear or branched fatty acid, more preferably an acyl group derived from a C_{8-24} saturated linear or branched fatty acid, even more preferably an acyl group derived from a C_{8-24} saturated linear fatty acid, and particularly preferably an acyl group derived from a C_{12-24} saturated linear fatty acid. Examples of such acyl groups include a capryloyl group, a pelargoyl group, a lauroyl group, a myristoyl group, a palmitoyl group, a stearoyl group, an isostearoyl group, an oleoyl group, and the like. Moreover, examples of salts of N-acylglutamic acid include alkali metal salts, such as sodium salts, disodium salts, and potassium salts, of N-acylglutamic acid; metal salts, such as aluminum salts; amine salts, such as triethanolamine salts; and the like.

[0016]

Specific examples of component (B) include N-lauroyl-L-glutamic acid, N-lauroyl-L-glutamic acid Na, N-lauroyl-L-glutamic acid 2Na, N-lauroyl-L-glutamic acid K, N-lauroyl-L-glutamic acid TEA, N-myristoyl-L-glutamic acid, N-myristoyl-L-glutamic acid Na, N-myristoyl-L-glutamic acid K, N-stearoyl-L-glutamic acid, N-stearoyl-L-glutamic acid Na, N-stearoyl-L-glutamic acid 2Na, N-stearoyl-L-glutamic acid K, N-stearoyl-L-glutamic acid Al, and the like. Among these, N-lauroyl-L-glutamic acid Na and N-stearoyl-L-glutamic acid Na are preferable, in terms of easy availability and cost effectiveness.

[0017]

The content of component (B) in the oil-in-water emulsion composition of the present invention is not limited within a range in which the effects of the present invention are

exhibited. For example, the content of component (B) is about 0.01 to 0.5 mass%, preferably about 0.05 to 0.4 mass%, and more preferably about 0.1 to 0.3 mass%, based on the total amount of the composition.

[0018]

Component (B) in the oil-in-water emulsion composition of the present invention may be used singly or in combination of two or more. When two or more types of components (B) are used in combination, the mixing ratio of each substance is not limited and can be suitably determined.

[0019]

The water-soluble sucrose fatty acid ester as component (C) is an ester having a structure in which a fatty acid is ester-bonded to the hydroxyl group of saccharose (sucrose). Sucrose fatty acid esters are present as monoesters to octaesters depending on the number of fatty acid residues ester-bonded to the eight hydroxyl groups present in sucrose. The water-soluble sucrose fatty acid ester as component (C) is not limited as long as it is water-soluble. Examples include sucrose mono-fatty acid esters, sucrose di-fatty acid esters, sucrose tri-fatty acid esters, and the like. Among these, sucrose mono-fatty acid esters are preferable. Moreover, the water-soluble sucrose fatty acid ester as component (C) may be a mixture containing a sucrose mono-fatty acid ester and at least one member selected from the group consisting of a sucrose di-fatty acid ester, a sucrose tri-fatty acid ester, a sucrose tetra-fatty acid ester, a sucrose penta-fatty acid ester, a sucrose hexa-fatty acid ester, a sucrose hepta-fatty acid ester, and a sucrose octa-fatty acid ester. The content of sucrose mono-fatty acid ester in the mixture is not limited within a range in which water solubility is exhibited. For example, the content of sucrose mono-fatty acid ester is 40 mass% or more, preferably 50 mass% or more, more preferably 60 mass% or more, and particularly preferably 70 mass% or more.

[0020]

The fatty acid in the water-soluble sucrose fatty acid ester is not limited, and is preferably a C_{8-24} saturated or unsaturated linear or branched fatty acid, more preferably a C_{8-24} saturated linear or branched fatty acid, even more preferably a C_{8-24} saturated linear fatty acid, and particularly preferably a C_{12-24} saturated linear fatty acid. Examples of such fatty acids include caprylic acid, pelargonic acid, lauric acid, myristic acid, palmitic acid, stearic acid, erucic acid, behenic acid, isostearic group, oleic acid, and the like.

[0021]

Specific examples of sucrose fatty acid esters include sucrose monolaurate, sucrose dilaurate, sucrose polylaurate, sucrose monostearate, sucrose distearate, sucrose tristearate, sucrose polystearate, sucrose monopalmitate, sucrose dipalmitate, sucrose tripalmitate, sucrose hexapalmitate, sucrose pentaerucate, sucrose hexaerucate, sucrose tribehenate, and the like. Among these, sucrose monostearate and sucrose monopalmitate are preferable. Specific examples of the water-soluble sucrose fatty acid ester as component (C) include mixtures containing 40 mass% or more, preferably 50 mass% or more, more preferably 60 mass% or more, and particularly preferably 70 mass% or more, of sucrose monostearate or sucrose monopalmitate.

[0022]

The content of component (C) in the oil-in-water emulsion composition of the present invention is not limited within a range in which the effects of the present invention are exhibited. For example, the content of component (C) is about 0.1 to 1.0 mass%, preferably about 0.2 to 0.9 mass%, and more preferably about 0.3 to 0.8 mass%, based on the total amount of the composition.

[0023]

Component (C) in the oil-in-water emulsion composition of the present invention may be used singly or in combination of two or more. When two or more types of components (C) are used in combination, the mixing ratio of each substance is not limited

and can be suitably determined.

[0024]

The glycerol mono-fatty acid ester as component (D) is a monoester of glycerol and fatty acid. The fatty acid in the glycerol mono-fatty acid ester is not limited, and is preferably a C_{8-24} saturated or unsaturated linear or branched fatty acid, and more preferably a C_{12-24} saturated or unsaturated linear or branched fatty acid. Examples of such fatty acids include caprylic acid, pelargonic acid, lauric acid, myristic acid, palmitic acid, stearic acid, isostearic acid, linoleic acid, arachidonic acid, oleic acid, and the like.

[0025]

Specific examples of component (D) include sucrose monolaurate (glyceryl laurate), glycerol monocaprylate (glyceryl caprylate), glycerol monocaprate (glyceryl caprate), glycerol monomyristate (glyceryl myristate), glycerol monopalmitate (glyceryl palmitate), glyceryl monostearate (glyceryl stearate), glycerol monoisostearate (glyceryl isostearate), glycerol monolinoleate (glyceryl linoleate), glycerol monoarachidonate (glyceryl arachidonate), glycerol monooleate (glyceryl oleate), and the like. Among these, glyceryl stearate and glyceryl oleate are preferable.

[0026]

The content of component (D) in the oil-in-water emulsion composition of the present invention is not limited within a range in which the effects of the present invention are exhibited. For example, the content of component (D) is about 0.1 to 3.0 mass%, preferably about 0.5 to 2.5 mass%, and more preferably about 0.5 to 2.0 mass%, based on the total amount of the composition.

[0027]

Component (D) in the oil-in-water emulsion composition of the present invention may be used singly or in combination of two or more. When two or more types of components (D) are used in combination, the mixing ratio of each substance is not limited

and can be suitably determined.

[0028]

Further, the oil-in-water emulsion composition of the present invention preferably comprises component (E): a higher alcohol. The term "higher alcohol" in the present specification refers to alcohol having 16 to 24 carbon atoms per molecule. Of higher alcohols, alcohol having 18 to 24 carbon atoms per molecule is preferable.

[0029]

Specific examples of component (E) include cetyl alcohol, isocetyl alcohol, stearyl alcohol, isostearyl alcohol, behenyl alcohol, and the like. Among these, behenyl alcohol is preferable.

[0030]

The content of component (E) in the oil-in-water emulsion composition of the present invention is not limited. For example, the content of component (E) is about 0.1 to 2.0 mass%, preferably about 0.1 to 1.5 mass%, and more preferably about 0.1 to 1.0 mass%, based on the total amount of the composition.

[0031]

Component (E) in the oil-in-water emulsion composition of the present invention may be used singly or in combination of two or more. When two or more types of components (E) are used in combination, the mixing ratio of each substance is not limited and can be suitably determined.

[0032]

Further, the oil-in-water emulsion composition of the present invention preferably comprises component (F): hydrogenated lecithin. Hydrogenated lecithin is a lecithin derivative obtained by hydrogenation of lecithin and is also called "hydrogen-added lecithin." Lecithin is not limited. Preferable is lecithin having a phosphatidylcholine content of 60 mass% or more, more preferably 70 mass% or more, even more preferably 80 mass% or more, and most preferably 90 mass% or more. Examples include soybean lecithin, corn lecithin, cotton

seed oil lecithin, yolk lecithin, albumen lecithin, and the like. Examples of commercially available lecithin include Phospholipon 80H and Phospholipon 90H (produced by Lipoid Kosmetik), Lipoid P100-3 and Lipoid P75-3 (produced by Lipoid), COATSOME NC-21 and COATSOME NC-61 (produced by NOF Corporation), Basis LS-60HR (produced by Nisshin Oillio Group, Ltd.), hydrogenated lecithin (produced by Ajinomoto Healthy Supply Co., Ltd.), and the like.

[0033]

The content of component (F) in the oil-in-water emulsion composition of the present invention is not limited. For example, the content of component (F) is about 0.01 to 0.2 mass%, preferably about 0.025 to 0.175 mass%, and more preferably about 0.05 to 0.15 mass%, based on the total amount of the composition.

[0034]

Moreover, the oil-in-water emulsion composition of the present invention may contain other components in addition to the above components. Other components are not limited, and components that can be generally mixed with cosmetics can be preferably used. Examples include oils and fats other than component (A) mentioned above, surfactants other than components (B) to (D) mentioned above, polymer compounds, alcohols, moisturizers, antioxidants, ultraviolet absorbers, preservatives, chelating agents, amino acids, sugars, vitamins, animal and plant extracts, coloring agents, powders such as inorganic powder and organic powder, PH adjusters such as organic acids and inorganic acids, and other components.

[0035]

Examples of oils and fats other than component (A) include plant oils other than meadowfoam oil; animal oils; hydrocarbon oils, such as liquid paraffin, squalane, and vaseline; silicone oils, such as chain polysiloxane, cyclic polysiloxane, methyl trimethicone, silicone resin, and modified polysiloxane; higher fatty acids, such as lauric acid, stearic acid, and oleic acid; waxes, such as beeswax, lanolin, and derivatives thereof; monoalkyl fatty acid esters; polyhydric

alcohol fatty acid esters; hydrogenated oils; and the like.

[0036]

Examples of surfactants other than components (B) to (D) and (F) include anionic surfactants, such as fatty acid soap, alkyl ether carboxylate, polyoxyethylene alkyl ether phosphate, and N-acyltaurine salts; ampholytic surfactants, such as imidazoline-based ampholytic surfactants and betaine-based surfactants; and nonionic surfactants, such as sorbitan-based surfactants, polyglycerol fatty acid esters, propylene glycol fatty acid esters, alkyl glycoside, polyoxyethylene sorbitan-based surfactants, polyoxyethylene glycerol fatty acid esters, polyoxyethylene propylene glycol fatty acid esters, polyoxyethylene hydrogenated castor oil derivatives, glycerol alkyl ether, polyoxyethylene alkyl ether, Pluronic surfactants, and alkanolamide.

[0037]

Examples of polymer compounds include non-natural polymers, such as polyethylene glycol having an average molecular weight of about tens of thousands, cellulose-based polymers, alginic acid-based polymers, starch-based polymers, acrylic-based polymers, and vinyl-based polymers; natural polymers, such as plant-based polymers (e.g., carrageenan, pectin, agar, starch, gum arabic, guar gum, and algecolloid), animal-based polymers (e.g., collagen and derivatives thereof, casein, and gelatin), and microorganism-based polymers (e.g., xanthan gum and gellan gum).

[0038]

Examples of alcohols include monovalent lower alcohols, such as ethyl alcohol and butyl alcohol; higher alcohols, such as lauryl alcohol, stearyl alcohol, behenyl alcohol, and batyl alcohol; polyhydric alcohols, such as ethylene glycol, propylene glycol, 1,3-butylene glycol, and glycerol; polyhydric alcohol polymers, such as dipropylene glycol, diglycerol, and polyglycerol; sugar alcohols, such as sorbitol, maltitol, mannitol, and erythritol; other alcohols, such as lanolin

alcohol, cholesterol, and phytosterol; and the like.

[0039]

Examples of moisturizers include polyhydric alcohols, such as low-molecular-weight polyethylene glycol, propylene glycol, 1,3-butylene glycol, and glycerol; chondroitin sulfate, hyaluronic acid, sodium lactate, pyrrolidone carboxylic acid salts, collagens, plant extract, and the like.

[0040]

The average particle size of oil droplets in the oil-in-water emulsion composition of the present invention is preferably 1.0 to 2.0 μm, more preferably 1.0 to 1.75 μm, and even more preferably 1.05 to 1.65 μm. The average particle size of the oil droplets is a median diameter measured with a laser diffraction particle size distribution analyzer (trade name: SALD-2200, produced by Shimadzu Corp.).

[0041]

Moreover, the oil droplets in the oil-in-water emulsion composition of the present invention preferably have a narrow particle size distribution width. Specifically, the standard deviation of the particle size distribution of the oil droplets is preferably 0.20 or less, more preferably 0.19 or less, even more preferably 0.18 or less, still more preferably 0.17 or less, and particularly preferably 0.16 or less. The standard deviation of the particle size distribution of the oil droplets is a value measured with a laser diffraction particle size distribution analyzer (trade name: SALD-2200, produced by Shimadzu Corp.).

[0042]

The form of the oil-in-water emulsion composition of the present invention is not limited. For example, the form may be a cream, a milky lotion, or the like. For example, the oil-in-water emulsion composition of the present invention can be suitably used as cosmetics in these forms.

[0043]

The method for producing the oil-in-water emulsion composition of the present invention is not limited. The oil-in-

water emulsion composition of the present invention can be produced according to a general method. For example, the oil-in-water emulsion composition of the present invention can be produced in the following manner. An oil phase containing components (A) and (D), and an aqueous phase containing components (B) and (C), are each prepared, and then warmed (preferably about 70 to 90°C), if necessary. The aqueous phase and the oil phase are then mixed and emulsified, and the resulting emulsion is cooled (preferably less than 50°C), thereby producing an oil-in-water emulsion composition. An emulsifier, such as a homomixer or a homogenizer, can be used for mixing.

Examples

[0044]

The present invention is described in more detail below with reference to Examples; however, the present invention is not limited to the following Examples.

[0045]

Production Example: Preparation of Oil-in-Water Emulsion Cosmetic

An oil phase and an aqueous phase were each prepared by mixing components each in an amount shown in Examples 1 to 10 and Comparative Examples 1 to 4 of Table 1 below. Subsequently, after the aqueous phase and the oil phase were warmed at 80 to 85°C, the oil phase was added to the aqueous phase, and the mixture was emulsified with a homomixer, followed by cooling to about 45°C. Thereafter, a neutralizing agent, alcohol, and additives were added each in an amount shown in Examples 1 to 10 and Comparative Examples 1 to 4 of Table 1 below, and the mixture was uniformly stirred, thereby preparing cosmetics of Examples 1 to 10 and Comparative Examples 1 to 4.

[0046]

After the cosmetics of Examples 1 to 10 and Comparative Examples 1 to 4 were prepared, it was confirmed by visual observation that all of the cosmetics were emulsified.

[0047]

Test Example: Analysis of Particle Size Distribution

The oil-in-water emulsion cosmetics of Examples 1 to 10 and Comparative Examples 1 to 4 prepared in the above Production Example were analyzed for the particle size distribution of oil droplets using a particle size distribution analyzer (trade name: SALD-2200, produced by Shimadzu Corp.). Figs. 1 to 14 show the analysis results of the particle size distribution of oil droplets in each oil-in-water emulsion cosmetic. Further, the average particle size (median diameter) of oil droplets and the standard deviation of the particle size distribution were calculated. The "Test result" column in Table 1 below shows the calculation results.

[0048]

Table 1

Component [unit: mass%]			Example 1	Example 2	Example 3	Example 4	Example 5	Example 6	Example 7	Example 8	Example 9	Example 10	Comparative Example 1	Comparative Example 2	Comparative Example 3	Comparative Example 4
Oil phase	(A)	Meadowfoam oil	10	10	6	7	15	10	10	10	10	10	10	10	10	10
	(D)	Glyceryl stearate	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2			1.2	1.2		
		Glyceryl oleate									1.2	1.2			1.2	1.2
	(E)	Behenyl alcohol	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5
	(F)	Hydroxylated lecithin	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1
		Shea butter	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2
		Vaseline	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2
		Beeswax	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2
Aqueous phase	(B)	N-stearoyl-L-glutamic acid Na	0.2		0.2	0.2	0.2	0.1	0.3	0.2	0.2	0.2				
		N-lauroyl-L-glutamic acid Na		0.2												
	(C)	Sucrose stearate (monoester content: 70%)	0.6	0.6	0.6	0.6	0.6	0.6	0.6				0.6		0.6	
		Sucrose palmitate (monoester content: 70%)								0.6	0.6	0.6		0.6		0.6
		Purified water	Balance	Balance	Balance	Balance	Balance	Balance	Balance	Balance	Balance	Balance	Balance	Balance	Balance	Balance
		Glycerol	10	10	10	10	10	10	10	10	10	10	10	10	10	10
		Diglycerol	2	2	2	2	2	2	2	2	2	2	2	2	2	2
		1,3-butylene glycol	5	5	5	5	5	5	5	5	5	5	5	5	5	5
		1% carbomer aqueous solution	5	5	5	5	5	5	5	5	5	5	5	5	5	5
		1% xanthane gum aqueous solution	5	5	5	5	5	5	5	5	5	5	5	5	5	5
		(Acrylic acid Na/acryloyldimethyltauric acid Na) copolymer	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2
Neutralizing agent		10% aqueous sodium hydroxide	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25
Preservative		95% ethanol	5	5	5	5	5	5	5	5	5	5	5	5	5	5
		Phenoxy ethanol	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3
Total			100	100	100	100	100	100	100	100	100	100	100	100	100	100

Test result	Average particle size (median diameter) [unit: μm]	1.075	1.166	1.268	1.370	1.384	1.626	1.238	1.378	1.308	1.423	10.260	2.718	15.041	8.002
	Standard deviation of particle size distribution	0.139	0.135	0.130	0.123	0.116	0.123	0.129	0.153	0.117	0.123	0.489	0.251	0.791	0.441

[0049]

The above results confirmed that oil droplets formed in the cosmetics comprising meadowfoam oil, a water-soluble sucrose fatty acid ester, and a glycerol mono-fatty acid ester (Comparative Examples 1 to 4) had an average particle size of greater than 2 μm, and the oil droplet particles were not uniform with a wide particle size distribution width. In contrast, it was confirmed that oil droplets formed in the cosmetics comprising meadowfoam oil, a water-soluble sucrose fatty acid ester, a glycerol mono-fatty acid ester, and N-acylglutamic acid (Examples 1 to 10) had an average particle size of 2 μm or less, and that the oil droplet particles were uniform with a narrow particle size distribution width.

CLAIMS

[Claim 1]

An oil-in-water emulsion composition comprising:

component (A): meadowfoam oil,

component (B): N-acylglutamic acid and/or a salt thereof,

component (C): a water-soluble sucrose fatty acid ester, and

component (D): a glycerol mono-fatty acid ester.

[Claim 2]

The oil-in-water emulsion composition according to claim 1, wherein component (A) is contained in an amount of 1 to 20 mass% based on the total amount of the composition.

[Claim 3]

The oil-in-water emulsion composition according to claim 1 or 2, wherein component (B) is contained in an amount of 0.05 to 0.5 mass% based on the total amount of the composition.

[Claim 4]

The oil-in-water emulsion composition according to any one of claims 1 to 3, further comprising component (E): a higher alcohol.

[Claim 5]

The oil-in-water emulsion composition according to any one of claims 1 to 4, further comprising component (F): hydrogenated lecithin.

[Claim 6]

The oil-in-water emulsion composition according to any one of claims 1 to 5, wherein the average particle size of oil droplets is 1.0 to 2.0 μm.

[Claim 7]

The oil-in-water emulsion composition according to any one of claims 1 to 6, wherein the standard deviation of the particle size distribution of oil droplets is 0.20 or less.

[Claim 8]

The oil-in-water emulsion composition according to any one of claims 1 to 7, which is a cosmetic.