

LIQUID SKIN CLEANSING AGENT AND LIQUID SKIN CLEANSING PRODUCT

Technical Field

[0001]

The present disclosure is related to a liquid skin cleansing agent and a liquid skin cleansing product.

Background Art

[0002]

Recently, skin cleansers that impart a smooth and moist feel to the skin after cleansing, and those that foam finely and densely are preferred because of a pleasant sensation when the foam contacts skin. Various studies have been conducted to satisfy such demands. Use of a cationized polymer in order to improve the smoothness and moist feel of the skin after cleansing is widely known. In addition, use of a nonionic polymer such as polyethylene glycol in order to cause foam to become dense is also known.

[0003]

For example, Patent Document 1 discloses that a cleansing composition that imparts a conditioning action may be obtained by employing a cationic polymer combined with a specific anionic surfactant. In addition, Patent Document 2 discloses that a cleansing agent in the form of a paste, which has a fine foam and favorably spreading properties may be obtained by employing an unneutralized fatty acid soap, a cationic polymer, polyethylene glycol having a specific molecular weight, etc. Further, Patent Document 3 discloses that a composition which is superior in skin protection may be obtained by using a cationic polymer having a specific degree of cation substitution and a specific molecular weight.

[Background Art Documents]

[Patent Documents]

[0004]

[Patent Document 1]

Japanese Patent No. 4965452

[Patent Document 2]

Japanese Patent No. 5555003

[Patent Document 3]

Japanese Patent No. 5436778

Summary

[0005]

It is known that when a cationized polygalactomannan, for example, is included in a composition as a cationic polymer in order to improve the smoothness of skin after cleansing, the inner viscosity of the composition increases. If the inner viscosity increases excessively, there will be a problem that a liquid cleaning agent cannot be discharged from a discharge port of a container having a dispenser. In addition, there is a tendency for the viscosity of cleansing compositions that include unneutralized fatty acid soap to increase during winter due to an excess fatty acid content. Meanwhile, if an excessive amount of polyethylene glycol is added to cause foam to become dense, there is a tendency for the smoothness of skin after cleansing to be impaired, and also a problem that such a skin cleanser becomes stringy at discharge ports of containers. The preparations for liquid skin cleansing agents which are disclosed in the above patent documents are insufficient to realize all of density of foam, smoothness of skin after cleansing, and discharge properties from a container having a dispenser at low temperatures. Here, the term "liquid" refers to a substance having fluidity at room temperature and a measured value of 50000 mPa·s or less as measured by a B type viscometer.

[0006]

The present disclosure has been developed in view of the foregoing circumstances. The present disclosure provides a liquid skin cleansing agent and a liquid skin cleansing product that imparts smoothness to skin after cleansing, a dense foam, and favorable discharge properties from a dispenser even at low temperatures.

[0007]

The liquid skin cleansing agent of the present disclosure is a liquid skin cleansing agent that includes:

a fatty acid soap;

cationized polygalactomannan; and

polyethylene glycol;

the neutralization rate of the fatty acid soap being 90 mol% or greater and 99 mol% or less,

the content ratio of the cationized polygalactomannan with respect to the total amount of the liquid skin cleansing agent being 0.05% by mass or more, and

the polyethylene glycol having a weight average molecular weight Mw of 2,000,000 or greater.

[0008]

It is preferable for the content ratio of polyethylene glycol with respect to the total amount of liquid skin cleansing agent to be 0.01% by mass or greater and 0.1% by mass or less.

[0009]

Further, the liquid skin cleansing agent of the present disclosure may include cationized polymers other than cationized polygalactomannan.

[0010]

It is preferable for the N content ratio of cationized polygalactomannan to be 0.2% or greater and 3.0% or less.

[0011]

The liquid skin cleansing agent of the present disclosure may further include a dihydric alcohol.

[0012]

It is preferable for the mass of the dihydric alcohol/the mass of the cationized polygalactomannan, which is the mass ratio of the dihydric alcohol with respect to the cationized polygalactomannan, to be 20 or greater.

[0013]

The liquid skin cleansing product of the present disclosure is a container filled with the liquid skin cleansing agent of the present disclosure.

[0014]

The liquid skin cleansing agent of the present disclosure is a liquid skin cleansing agent that includes a fatty acid soap, cationized polygalactomannan, and polyethylene glycol, wherein the neutralization rate of the fatty acid soap is 90 mol% or greater and 99 mol% or less, the content ratio of the cationized polygalactomannan with respect to the total amount of the liquid skin cleansing agent is 0.05% by mass or greater, and the weight average molecular weight M_w of the polyethylene glycol is 2,000,000 or greater. Therefore, the liquid skin cleansing agent of the present disclosure imparts smoothness to skin after cleansing, has a dense foam, and is capable of being discharged from a dispenser.

Detailed Description of the Embodiments

[0015]

Hereinafter, a liquid skin cleansing agent of the present disclosure will be described in detail.

The liquid skin cleansing agent of the present disclosure is a liquid skin cleansing agent that includes a fatty acid soap, cationized polygalactomannan, and polyethylene glycol, wherein the neutralization rate of the fatty acid soap is 90 mol% or

greater and 99 mol% or less, the content ratio of the cationized polygalactomannan with respect to the total amount of the liquid skin cleansing agent is 0.05% by mass or greater, and the weight average molecular weight M_w of the polyethylene glycol is 2,000,000 or greater.

Each component will be described in detail below.

[0016]

(Fatty Acid Soap)

The fatty acid soap used in the present disclosure is a fatty acid salt obtained by neutralizing a fatty acid and an alkali. Examples of the fatty acid that constitutes the fatty acid salt include capric acid, lauric acid, myristic acid, palmitic acid, stearic acid, isostearic acid, oleic acid, linoleic acid, arachidic acid, behenic acid, lignoceric acid, coconut oil fatty acid, etc.

[0017]

In addition, potassium hydroxide is an example of the alkali.

[0018]

The neutralization rate of the fatty acid soap is 90 mol% or greater and 99 mol% or less, and preferably 93 mol% or greater and 96 mol% or less. By setting the neutralization rate to 90 mol% or greater, even if the viscosity rises at a low temperature of, for example, 5°C, the liquid skin cleansing agent can be discharged from a dispenser. Further, by setting the neutralization rate to 99% mol or less, the liquid cleansing agent can impart smoothness to skin after cleansing.

Here, the neutralization rate of the fatty acid soap is a value obtained by dividing the amount (mol) of the neutralized fatty acid by the total amount (mol) of the fatty acid.

[0019]

It is preferable for the content ratio of the fatty acid soap with respect to the total amount of the liquid skin cleansing agent to be within a range from 5% by mass to 30% by mass, more preferably a range from 10% by mass to 25% by mass, and still more preferably a range from 15% by mass to 25% by mass, from the viewpoint of ensuring cleansing and foaming properties.

[0020]

(Cationized Polygalactomannan)

The cationized polygalactomannan is a cationized water soluble polymer having a main chain of mannose and a side chain of galactose. Cationized polymers having a ratio of galactose to mannose of 1: 2 are called cationized guar gum, those having a ratio of galactose to mannose of 1: 3 are called cationized tara gam, and those

having a ratio of galactose to mannose of 1: 4 are called cationized locust bean gum. Cationized polymers having any of these ratios may be employed in the present disclosure.

The cationized polygalactomannan is obtained by reacting galactomannan with a cationizing agent. A tertiary amino compound or a quaternary ammonium compound containing a group capable of reacting with the reactive hydrogen ion present in the galactomannan may be employed as the cationizing agent. Examples include: 2-dialkylaminoethyl chloride and quaternary ammonium compounds such as 3-chloro-2-hydroxypropyltrimethylammonium chloride and 2,3-epoxy-propyltrimethylammonium chloride. Preferred examples include: glycidyltrialkylammonium salts and 3-halo-2-hydroxypropyltrialkylammonium salts such as glycidyltrimethylammonium chloride, glycidyltriethylammonium chloride, glycidyltripropylammonium chloride, glycidylethyldimethylammonium chloride, and glycidyl-diethylmethylammonium chlorides, as well as bromides and iodides corresponding thereto; 3-chloro-2-hydroxypropyltrimethylammonium chloride, 3-chloro-2-hydroxypropyltriethylammonium chloride, 3-chloro-2-hydroxypropyltripropyl ammonium chloride, and 3-chloro-2-hydroxypropylethyl dimethyl ammonium chloride, as well as bromides and iodides corresponding thereto; and quaternary ammonium compounds such as halogen compounds that include an imidazoline ring.

A single cationized polygalactomannan may be employed, or a combination of two or more cationized polygalactomannans may be employed.

[0021]

Examples of commercially available products may include Rhaball Gum CG-M6L (N content ratio 1.0 to 1.5%), Rhaball Gum CG-M (N content ratio: 1.7 to 2.3%), and Rhaball Gum CG-M 8 M (N content ratio: 2.2 to 2.8%) manufactured by DSP Gokyo Food & Chemical K. K.; and Catinal CG-100 S (N content ratio: 1.0 to 1.7%) manufactured by Toho Chemical Industry K. K.

[0022]

It is preferable for the N content ratio of the cationized polygalactomannan to be within a range from 0.2% to 3.0%, and more preferably a range from 0.5% to 2.5%.

Here, the N content ratio is a value obtained from the percentage (% by weight) of nitrogen atoms which are contained in the cationized polygalactomannan component.

[0023]

It is preferable for the molecular weight of the cationized polygalactomannan which is employed in the liquid skin cleansing agent of the present disclosure to be within a range from 10,000 to 10,000,000, more preferably a range from 30,000 to

3,000,000, and most preferably a range from 100,000 to 2,000,000, from the viewpoint of discharge properties from a pump or a container having a dispenser and the like, and also from the viewpoint of preventing stringiness.

[0024]

The content ratio of the cationized polygalactomannan with respect to the total amount of the liquid skin cleansing agent is 0.05% by mass or greater. The upper limit is preferably 1.0% by mass or less, and more preferably 0.1% by mass or greater and 0.5% by mass or less, from the viewpoint of discharge properties from a pump or a container having a dispenser and the like, and also from the viewpoint of preventing stringiness.

[0025]

(Polyethylene Glycol)

The weight average molecular weight Mw of the polyethylene glycol which is employed in the present disclosure is 2,000,000 or greater. It is preferable for the upper limit of the molecular weight Mw to be 8,000,000 or less. It is more preferable for the molecular weight Mw to be 3,000,000 or greater and 7,000,000 or less.

In addition, it is preferable for the content ratio of the polyethylene glycol with respect to the total amount of liquid skin cleansing agent to be preferably 0.01% by mass or greater and 0.20% by mass or less, more preferably 0.01% by mass or greater and 0.10% by mass or less, and even more preferably 0.02% by mass or greater and 0.05% by mass or less. By setting the content ratio of the polyethylene glycol to 0.01% by mass or greater, foam can become dense. Further, by setting the content ratio to 0.20% by mass or less, it will become possible to prevent bubbling properties from deteriorating and the volume of foam from decreasing.

Here, the weight average molecular weight Mw of polyethylene glycol is a value obtained by column analysis.

[0026]

Examples of commercially available products include: Alcox E-300 (weight average molecular weight: approximately 7,000,000), Alcox E-240 (weight average molecular weight: approximately 5,000,000), Alcox E-160 (weight average molecular weight: approximately 4,000,000), Alcox E-100 (weight average molecular weight: approximately 3,000,000), and Alcox E-75 (weight average molecular weight: approximately 2,000,000) manufactured by Meisei Chemical Industries K. K.; Polyox WSR 301 (weight average molecular weight: approximately 4,000,000), Polyox WSR N60K CG (weight average molecular weight: approximately 2,000,000), and Polyox N80 (weight average molecular weight 220,000) manufactured by Dow Chemical Japan

K. K.; and PEO-27P (weight average molecular weight: approximately 7,200,000), PEO-18P (weight average molecular weight: approximately 4,800,000), PEO-15P (weight average molecular weight: approximately 4,000,000), and PEO-8P (weight average molecular weight: approximately 2,000,000), manufactured by Sumitomo Seika Chemicals K. K.

[0027]

(Cationized Polymers other than Cationized Polygalactomannan)

Examples of cationized polymers include cationized cellulose, cationized starch, diallyl dialkyl quaternary ammonium salt/acrylamide copolymers, diallyl dialkyl quaternary ammonium salt/acrylamide/acrylic acid copolymers, etc. Among these, cationized cellulose and diallyl dialkyl quaternary ammonium salt/acrylamide copolymers are preferable, and diallyl dialkyl quaternary ammonium salt/acrylamide copolymers are more preferable.

Examples of diallyl dialkyl quaternary ammonium salt/acrylamide copolymers include: Merquat 550 (weight average molecular weight: 160,000, cationic charge density: 4.22 meq/g); Merquat 2200 (weight average molecular weight: 90,000, cationic charge density: 4.22 meq/g), and Merquat S (weight average molecular weight: 260,000, cationic charge density: 4.22 meq/g) [copolymers of acrylamide and diallyldimethylammonium salt manufactured by Lubrizol Japan, Inc.]; Poise C-60H (weight average molecular weight: 600,000, cationic charge density: 1.07 to 1.78 meq/g), Caticello M-80 (weight average molecular weight: 800,000, cationic charge density: 0.93 to 1.21 meq/g), and Poise C-150 L (weight average molecular weight: 1,500,000, cationic charge density: 0.71 to 1.07 meq/g) [cationized celluloses (O-[2-hydroxy-3-(trimethylammonio) propyl] hydroxyethylcellulose) chloride) manufactured by Kao].

[0028]

(Dihydric Alcohol)

The liquid skin cleansing agent of the present disclosure may further include a dihydric alcohol. Examples of dihydric alcohols may include propylene glycol, dipropylene glycol, butylene glycol, isoprene glycol, etc. The dihydric alcohol serves as a humectant.

[0029]

It is preferable for the content ratio of the dihydric alcohol with respect to the total amount of the liquid skin cleansing agent to be preferably within a range from 1 to 15, and more preferably a range from 4 to 10.

[0030]

It is preferable for the mass of the dihydric alcohol/the mass of the cationized polygalactomannan, which is the mass ratio of the dihydric alcohol with respect to the cationized polygalactomannan, to be 16 or greater and more preferably 20 or greater, from the viewpoint of improving discharge properties from a dispenser. It is preferable for the upper limit to be preferably 30 or less, from the viewpoint of improving foaming. An even more preferable range for the mass ratio of the dihydric alcohol with respect to the cationized polygalactomannan is from 22 to 28.

[0031]

(Other Components)

The liquid skin cleansing agent of the present disclosure may include other components within a range that does not impair the advantageous effects of the present disclosure. Examples of other components include anionic surfactants, nonionic surfactants, ampholytic surfactants, thickeners, polyhydric alcohols, chelating agents, humectants, aqueous carriers, pH adjusters, and fragrances.

[0032]

Examples of anionic surfactants include: ammonium lauryl sulfate, ammonium laureth sulfate, triethylamine lauryl sulfate, triethylamine laureth sulfate, triethanolamine lauryl sulfate, triethanolamine laureth sulfate, monoethanolamine lauryl sulfate, monoethanol amine laureth sulfate, diethanol amine lauryl sulfate, laureth sulfuric acid diethanolamine, sodium lauryl monoglyceride sulfate, sodium lauryl sulfate, sodium laureth sulfate, potassium lauryl sulfate, potassium laureth sulfate, sodium lauryl sarcosinate, sodium lauroyl sarcosinate, lauryl sarcosine, cocoyl sarcosinate, ammonium cocoyl sulfate, ammonium lauroyl sulfate, sodium cocoyl sulfate, sodium lauroyl sulfate, potassium cocoyl sulfate, potassium lauryl sulfate, lauryl sulfate triethanolamine, lauryl sulfate triethanolamine, cocoyl sulfate monoethanolamine, and lauryl sulfate monoethanolamine, as well as combinations thereof.

[0033]

In addition, it is also possible to use reaction products of fatty acids (for example, fatty acids derived from coconut oil or palm kernel oil) which are esterified with isethionic acid and neutralized with sodium hydroxide, as well as sodium or potassium salts of fatty acid amides of methyl tauride (for example, fatty acids derived from coconut oil or palm kernel oil).

[0034]

Nonionic surfactants are generally defined as compounds comprising a hydrophobic component and a nonionic hydrophilic component. Examples of

hydrophobic components include alkyl, alkyl aromatics, dialkylsiloxane, polyoxyalkylene, and alkyl substituted with fluoro. Examples of hydrophilic components are polyoxyalkylene, phosphine oxide, sulfoxide, amine oxide, and amide. Other examples of nonionic surfactants include alkyl polysaccharides, for example alkyl polysaccharides.

[0035]

Examples of ampholytic surfactants may include amine oxide, sulfobetaine, carbobetaine, etc.

[0036]

Examples of thickeners may include NaCl, NH₄Cl, KCl, Na₂SO₄, an aliphatic alcohol, a fatty acid ester, a fatty acid amide, an aliphatic alcohol polyethylene glycol ether, sorbitol polyethylene glycol ether, cocamide monoethanolamide (cocamide MEA), cocamide diethanolamide, cocamidopropyl betaine, clay, silica, cellulosic polymers, and xanthan.

[0037]

Examples of polyhydric alcohols may include glycerin, sorbitol, xylitol, maltitol, etc.

[0038]

For example, it is preferable for the chelating agent to be at least one selected from a group consisting of ethane-1-hydroxy-1,1-diphosphonic acid, ethylenediaminetetraacetic acid, methylglycinediacetic acid, hydroxyethyliminodiacetic acid, ethylenediamine disuccinic acid, L-glutamic acid-N, N-diacetic acid, N-2-hydroxyethyliminodiacetic acid, citric acid, succinic acid, and salts thereof.

[0039]

Examples of aqueous carriers may include purified water and a lower alcohol having a carbon number within a range from 2 to 6. Purified water is preferable. It is preferable for the aqueous carrier to be included at an amount of 30% by mass or greater and 70% by mass or less with respect to the total amount of the liquid skin cleansing agent.

[0040]

The liquid skin cleansing agent of the present disclosure can be filled into a container having a one touch plug or a liquid dispenser, for example, to become a liquid skin cleansing product.

[Examples]

[0041]

The present disclosure will be described in greater detail below with reference

to Examples. However, the present disclosure is not limited to these Examples. In addition, the blended amounts in the following Examples, etc. are % by mass unless otherwise specified.

[0042]

[Examples 1 through 17, Comparative Examples 1 through 8]

Liquid skin cleansing agents having the compositions shown Tables 1 through 4 below were produced by a conventional method. The discharge properties from a liquid dispenser, the smoothness of skin after cleansing, and the density of foam were evaluated for each of the liquid skin cleansing agents.

[0043]

<Discharge Properties from Liquid Dispenser at Low Temperature (5°C)>

The discharge properties of the liquid skin cleansing agents from a liquid dispenser at low temperature (5°C) were evaluated based on the following evaluation criteria.

Samples were placed in a container with a liquid dispenser and stored in a constant temperature bath at 5°C for 24 hours. Thereafter, the operability of the dispenser immediately after removal from the bath was evaluated as follows. P-308, which is manufactured by K. K. Yoshino Kogyo and is generally employed for liquid cleaning agents, was employed as the dispenser.

[0044]

(Evaluation criteria)

A: Sample can be easily discharged.

B: The dispenser feels heavy or the return of the dispenser after discharge is slow (less than 10 seconds) but sample can be discharged.

C: Discharge cannot be performed or the dispenser does not return for more than 10 seconds after discharge.

[0045]

<Smoothness of Skin After Cleansing, Denseness of Foam>

A panel of 5 experts utilized each sample in a normal manner, and then were given questionnaires directed to the following items, and average evaluation scores were assigned based on the results.

Smoothness of Skin After Cleansing: The degree of skin smoothness after rinsing the liquid skin cleansing agent off is high.

Density of Foam: foam has elasticity.

1: Strongly Disagree

2: Disagree

4: Agree

5: Strongly Agree

[0046]

(Evaluation Criteria)

Based on the above average evaluation scores, evaluations were designated as follows.

AA: Average Evaluation Score ≥ 4.5

A: $4.5 > \text{Average Evaluation Score} > 3.5$

B: $2.5 \leq \text{Average Evaluation Score} \leq 3.5$

C: Average Evaluation Score < 2.5

[0047]

The evaluation results are shown in Tables 1 to 4 together with the compositional ratios of the materials.

[0048]

[Table 1]

		Example 1	Example 2	Example 3	Comparative Example 1	Comparative Example 2	Comparative Example 3
Fatty Acid Soap	Coconut Oil Fatty Acid	6.0	6.0	6.0	6.0	6.0	6.0
	Lauric Acid	6.0	6.0	6.0	6.0	6.0	6.0
	Myristic Acid	5.0	5.0	5.0	5.0	5.0	5.0
	Palmitic Acid	5.0	5.0	5.0	5.0	5.0	5.0
	Potassium Hydroxide	q. s.	q. s.	q. s.	q. s.	q. s.	q. s.
Polygalactomannan	Guar-Hydroxypropyltrimonium Chloride (High N Content)	0.3					
	Guar-Hydroxypropyltrimonium Chloride (Medium N Content)		0.3				
	Guar-Hydroxypropyltrimonium Chloride (Low N Content)			0.3			
	Guar Gum (nonionic)				0.3		
Polyethylene Glycol	Weight Average Molecular Weight 7,000,000						
	Weight Average Molecular Weight 5,000,000	0.03	0.03	0.03	0.03	0.03	
	Weight Average Molecular Weight 4,000,000						
	Weight Average Molecular Weight 3,000,000						
	Weight Average Molecular Weight 2,000,000						
	Weight Average Molecular Weight 220,000						
Other Components	Propylene Glycol	8.0	8.0	8.0	8.0	8.0	8.0
	Laureth Sulfate Na (30% aqueous solution)	7.0	7.0	7.0	7.0	7.0	7.0
	Cocamidopropyl Betaine (30% aqueous solution)	6.0	6.0	6.0	6.0	6.0	6.0
	Cocamide MEA	0.2	0.2	0.2	0.2	0.2	0.2
	Chelating Agent	q. s.	q. s.	q. s.	q. s.	q. s.	q. s.
	Fragrance	q. s.	q. s.	q. s.	q. s.	q. s.	q. s.
	Purified Water	remainder	remainder	remainder	remainder	remainder	remainder
Evaluations	Discharge Properties from Dispenser at Low Temperature (5°C)	B	A	A	A	A	A
	Smoothness of Skin After Cleansing	A	A	A	C	C	C
	Density of Foam	A	A	A	A	A	C
	Neutralization Rate (mol%)	93	93	93	93	93	93

[0049]

[Table 2]

		Example 4	Example 5	Example 6	Example 7	Comparative Example 4	Comparative Example 5
Fatty Acid Soap	Coconut Oil Fatty Acid	6.0	6.0	6.0	6.0	6.0	6.0
	Lauric Acid	6.0	6.0	6.0	6.0	6.0	6.0
	Myristic Acid	5.0	5.0	5.0	5.0	5.0	5.0
	Palmitic Acid	5.0	5.0	5.0	5.0	5.0	5.0
	Potassium Hydroxide	q. s.	q. s.	q. s.	q. s.	q. s.	q. s.
Polygalactomannan	Guar-Hydroxypropyltrimonium Chloride (High N Content)						
	Guar-Hydroxypropyltrimonium Chloride (Medium N Content)	0.3	0.3	0.3	0.3	0.3	0.3
	Guar-Hydroxypropyltrimonium Chloride (Low N Content)						
	Guar Gum (nonionic)						
Polyethylene Glycol	Weight Average Molecular Weight 7,000,000	0.03					
	Weight Average Molecular Weight 5,000,000						
	Weight Average Molecular Weight 4,000,000		0.03				
	Weight Average Molecular Weight 3,000,000			0.03			
	Weight Average Molecular Weight 2,000,000				0.03		
	Weight Average Molecular Weight 220,000					0.03	
Other Components	Propylene Glycol	8.0	8.0	8.0	8.0	8.0	8.0
	Laureth Sulfate Na (30% aqueous solution)	7.0	7.0	7.0	7.0	7.0	7.0
	Cocamidopropyl Betaine (30% aqueous solution)	6.0	6.0	6.0	6.0	6.0	6.0
	Cocamide MEA	0.2	0.2	0.2	0.2	0.2	0.2
	Chelating Agent	q. s.	q. s.	q. s.	q. s.	q. s.	q. s.
	Fragrance	q. s.	q. s.	q. s.	q. s.	q. s.	q. s.
	Purified Water	remainder	remainder	remainder	remainder	remainder	remainder
Evaluations	Discharge Properties from Dispenser at Low Temperature (5°C)	A	A	A	A	A	A
	Smoothness of Skin After Cleansing	B	A	A	A	C	A
	Density of Foam	A	A	A	A	C	C
	Neutralization Rate (mol%)	93	93	93	93	93	93

[0050]

[Table 3]

		Example 8	Example 9	Example 10	Example 11	Comparative Example 6
Fatty Acid Soap	Coconut Oil Fatty Acid	6.0	6.0	6.0	6.0	6.0
	Lauric Acid	6.0	6.0	6.0	6.0	6.0
	Myristic Acid	5.0	5.0	5.0	5.0	5.0
	Palmitic Acid	5.0	5.0	5.0	5.0	5.0
	Potassium Hydroxide	q. s.	q. s.	q. s.	q. s.	q. s.
Polygalactomannan	Guar-Hydroxypropyltrimonium Chloride (High N Content)					
	Guar-Hydroxypropyltrimonium Chloride (Medium N Content)	0.05	0.5	0.3	0.3	0.01
	Guar-Hydroxypropyltrimonium Chloride (Low N Content)					
	Guar Gum (nonionic)					
Polyethylene Glycol	Weight Average Molecular Weight 7,000,000					
	Weight Average Molecular Weight 5,000,000	0.03	0.03	0.01	0.10	0.03
	Weight Average Molecular Weight 4,000,000					
	Weight Average Molecular Weight 3,000,000					
	Weight Average Molecular Weight 2,000,000					
	Weight Average Molecular Weight 220,000					
Other Components	Propylene Glycol	8.0	8.0	8.0	8.0	8.0
	Laureth Sulfate Na (30% aqueous solution)	7.0	7.0	7.0	7.0	7.0
	Cocamidopropyl Betaine (30% aqueous solution)	6.0	6.0	6.0	6.0	6.0
	Cocamide MEA	0.2	0.2	0.2	0.2	0.2
	Chelating Agent	q. s.	q. s.	q. s.	q. s.	q. s.
	Fragrance	q. s.	q. s.	q. s.	q. s.	q. s.
	Purified Water	remainder	remainder	remainder	remainder	remainder
Evaluations	Discharge Properties from Dispenser at Low Temperature (5°C)	A	B	A	B	A
	Smoothness of Skin After Cleansing	B	AA	A	B	C
	Density of Foam	A	A	B	A	A
	Neutralization Rate (mol%)	93	93	93	93	93

[0051]

[Table 4]

		Example 12	Example 13	Example 14	Comparative Example 7	Comparative Example 8	Example 15	Example 16	Example 17
Fatty Acid Soap	Coconut Oil Fatty Acid	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0
	Lauric Acid	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0
	Myristic Acid	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
	Palmitic Acid	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
	Potassium Hydroxide	q. s.	q. s.	q. s.	q. s.	q. s.	q. s.	q. s.	q. s.
Polygalactomannan	Guar-Hydroxypropyltrimonium Chloride (High N Content)								
	Guar-Hydroxypropyltrimonium Chloride (Medium N Content)	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3
	Guar-Hydroxypropyltrimonium Chloride (Low N Content)								
	Guar Gum (nonionic)								
Polyethylene Glycol	Weight Average Molecular Weight 7,000,000								
	Weight Average Molecular Weight 5,000,000	0.03	0.03	0.03	0.03	0.03	0.03	0.03	0.03
	Weight Average Molecular Weight 4,000,000								
	Weight Average Molecular Weight 3,000,000								
	Weight Average Molecular Weight 2,000,000								
	Weight Average Molecular Weight 220,000								
Other Components	Propylene Glycol	8.0	8.0	8.0	8.0	8.0	7.0	6.0	5.0
	Laureth Sulfate Na (30% aqueous solution)	7.0	7.0	7.0	7.0	7.0	8.0	8.0	8.0
	Cocamidopropyl Betaine (30% aqueous solution)	6.0	6.0	6.0	6.0	6.0	7.0	7.0	7.0
	Cocamide MEA	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2
	Chelating Agent	q. s.	q. s.	q. s.	q. s.	q. s.	q. s.	q. s.	q. s.
	Fragrance	q. s.	q. s.	q. s.	q. s.	q. s.	q. s.	q. s.	q. s.
	Purified Water	remainder	remainder	remainder	remainder	remainder	remainder	remainder	remainder
Evaluations	Discharge Properties from Dispenser at Low Temperature (5°C)	B	A	A	C	A	A	B	B
	Smoothness of Skin After Cleansing	A	A	A	A	B	A	A	A
	Density of Foam	A	A	B	A	C	A	A	A
	Neutralization Rate (mol%)	90	96	99	87	102	96	96	96

[0052]

The details of the materials in Tables 1 to 4 above are as follows.

(Polygalactomannan)

- Guar hydroxypropyltrimonium chloride (low N content): Rhaball gum CG-M6L (manufactured by DSP Gokyo Food & Chemical K. K.)
- Guar hydroxypropyltrimonium chloride (medium N content): Rhaball gum CG-M (manufactured by DSP Gokyo Food & Chemical K. K.)
- Guar hydroxypropyl trimonium chloride (high N content): Rhaball gum CG-M 8 M (DSP Gokyo Food & Chemical K. K.)
- Cugar gum (nonionic): Meyprogat 90-S (manufactured by Sansho K. K.)

[0053]

(Polyethylene Glycol)

- Weight average molecular weight (approximately 7,000,000): Alcox E-300 (manufactured by Meisei Chemical Industry K. K.)
- Weight average molecular weight (approximately 5,000,000): Alcox E-240 (manufactured by Meisei Chemical Industry K. K.)
- Weight average molecular weight (approximately 4,000,000): Alcox E-160 (manufactured by Meisei Chemical Industry K. K.)
- Weight average molecular weight (approximately 3,000,000): Alcox E-100 (manufactured by Meisei Chemical Industry K. K.)
- Weight average molecular weight (approximately 2,000,000): Alcox E-75 (manufactured by Meisei Chemical Industry K. K.)
- Weight average molecular weight (approximately 220,000): Polyox WSR N80 (manufactured by Dow · Chemical Japan K. K.)

[0054]

As can be understood from Table 1, Examples 1 through 3, in which the N content of the cationized polygalactomannan was within a range from 1.0 to 2.8%, exhibited favorable pump discharge properties at low temperature. In addition, the smoothness of skin after cleansing and the density of foam were also favorable. Particularly, Examples 2 and 3, in which the N content ratio was within a range from 1.0 to 2.3%, obtained favorable results with respect to all evaluations.

In contrast, Comparative Example 1, which employed nonionic guar gum, and Comparative Example 2, which did not employ cationized polygalactomannan, exhibited inferior results with respect to the smoothness of skin after cleansing. In addition, in Comparative Example 3, which did not include either cationized polygalactomannan or polyethylene glycol, the smoothness of skin after cleansing and the density of the foam were inferior to those of the Examples.

[0055]

As can be understood from Table 2, Comparative Example 4, which employed a polyethylene glycol having a molecular weight of 220,000, and Comparative Example 5, which did not employ polyethylene glycol, exhibited inferior density of foam compared to Examples 4 to 7, which employed polyethylene glycols having molecular weights of 2,000,000 or greater.

[0056]

As can be understood from Table 3, Comparative Example 6, in which the content ratio of the cationized polygalactomannan with respect to the total amount of the liquid skin cleansing agent was less than 0.05% by mass, the smoothness of skin after cleansing was inferior to that of the Examples.

[0057]

As can be understood from Table 4, Comparative Example 7, in which the neutralization rate of the fatty acid soap was low at 87 mol%, exhibited poor discharge properties from a dispenser. On the other hand, Comparative Example 8, in which the neutralization rate was excessively high at 102 mol%, the smoothness of skin after cleansing and the density of foam were poor.

[0058]

(Examples of Formulations)

Examples of formulations of the liquid skin cleansing agent of the present disclosure will be listed. The present disclosure is not limited to these formulation examples. Moreover, note that the blending amounts are represented by % by mass with respect to the total amount of the product.

[0059]

Formulation Example 1: Neutralization rate of fatty acid soap is 93 mol%.

Coconut oil fatty acid	5.0
Lauric acid	6.0
Myristic acid	5.0
Palmitic acid	5.0
Propylene glycol	7.0
Ethylene glycol distearate	1.5
Guar-hydroxypropyltrimonium chloride	0.2
(Rhaball Gum CG-M6L, manufactured by DSP Gokyo Food & Chemical K. K.)	
Polyethylene glycol	0.03
(Alcox E-240, manufactured by Meisei Chemical Industries K. K.)	
Laureth sulfate Na (30% aqueous solution)	7.5
Cocamidopropyl betaine (30% aqueous solution)	5.0
Cocamide MEA	0.1
Yuzu Extract	0.001
Polyquaternium-7	1.0
(Merquat 550, manufactured by Lubrizol Japan)	
Polyquaternium-39	1.0
(Merquat 3330, manufactured by Lubrizol Japan)	
Potassium hydroxide	q. s.
Chelating agent	q. s.
Perfume	q. s.
Purified water	remainder

The evaluations for Formulation Example 1 were A's for all of discharge properties from a liquid dispenser, smoothness of skin after cleansing, and density of foam.

[0060]

Formulation Example 2: Neutralization rate of fatty acid soap is 95 mol%.

Coconut oil fatty acid	5.0
Lauric acid	7.0
Myristic acid	6.0
Palmitic acid	5.0
Propylene glycol	8.0
Ethylene glycol distearate	2.0
Guar-hydroxypropyltrimonium chloride	0.3
(Catinal CG-100S, manufactured by Toho Chemical Industries K. K.)	
Polyethylene glycol	0.05
(Polyox WSR 301, manufactured by Dow Chemical Japan K. K.)	
Laureth sulfate Na (30% aqueous solution)	6.5
Cocamidopropyl betaine (30% aqueous solution)	6.5
Cocamide MEA	0.2
Polyquaternium-7	1.5
(Merquat 550, manufactured by Lubrizol Japan)	
Polyquaternium-51	0.01
Sodium hyaluronate	0.001
Hydroxypropylmethylcellulose	0.05
Potassium hydroxide	q. s.
Chelating agent	q. s.
Perfume	q. s.
Purified water	remainder

The evaluations for Formulation Example 2 were A's for all of discharge properties from a liquid dispenser, smoothness of skin after cleansing, and density of foam.

CLAIMS

1. A liquid skin cleansing agent comprising:
a fatty acid soap;
cationized polygalactomannan; and
polyethylene glycol;
the neutralization rate of the fatty acid soap being 90 mol% or greater and 99 mol% or less,
the content ratio of the cationized polygalactomannan with respect to the total amount of the liquid skin cleansing agent being 0.05% by mass or more, and
the polyethylene glycol having a weight average molecular weight Mw of 2,000,000 or greater.
2. A liquid skin cleansing agent as defined in Claim 1, wherein:
the content ratio of polyethylene glycol with respect to the total amount of liquid skin cleansing agent is 0.01% by mass or greater and 0.1% by mass or less.
3. A liquid skin cleansing agent as defined in Claim 1 or Claim 2, further comprising:
cationized polymers other than the cationized polygalactomannan.
4. A liquid skin cleansing agent as defined in any one of Claims 1 through 3, wherein:
the N content ratio of the cationized polygalactomannan is 0.2% or greater and 3.0% or less.
5. A liquid skin cleansing agent as defined in any one of Claims 1 through 4, further comprising:
a dihydric alcohol.
6. A liquid skin cleansing agent as defined in Claim 5, wherein:
the mass of the dihydric alcohol/the mass of the cationized polygalactomannan, which is the mass ratio of the dihydric alcohol with respect to the cationized polygalactomannan, is 20 or greater.
7. A liquid skin cleansing product, comprising:
a liquid skin cleansing agent as defined in any one of Claims 1 through 6; and
a container filled with the liquid skin cleansing agent.