

【DESCRIPTION】

【Invention Title】

SULFATE-FREE COMPOSITION FOR WASHING HAIR OR
CLEANSING SCALP COMPRISING BEAD

5

【Technical Field】

The present disclosure relates to a sulfate-free composition for washing hair or cleansing scalp.

10 【Background Art】

The skin (including scalp) is the outermost organ of the body, has various functions and is an important organ significantly affecting the appearance and image. Various cleansing products for washing hair and/or cleansing scalp use a synthetic surfactant, and such a synthetic surfactant tends to irritate the skin and eyes. In addition, when increasing the concentration of a synthetic surfactant for the purpose of cleansing power and bubbling capability, skin irritation, such as skin traction, itching or skin roughening, and eye irritation tend to be increased. Korean Patent Laid-Open No. 10-2006-0093211 discloses a liquid cleanser composition causing significantly reduced skin irritation by using, as an active ingredient, at least one material selected from the group consisting of: an alkyl ethoxy sulfate-based anionic surfactant; a low-irritative anionic surfactant; a non-ionic surfactant; an amphoteric surfactant; and additives having an irritation-alleviating effect.

However, the liquid cleanser composition is one including an alkyl ethoxylated sulfate-anionic surfactant known to cause relatively high irritation, and thus cannot provide a significantly high irritation-alleviating effect. Therefore, there is a need for research and development about a composition containing no sulfate-based surfactant and having excellent bubbling capability and turbidity.

【Disclosure】

【Technical Problem】

The present disclosure is designed to solve the problems of the related art, and the object of the present disclosure is to provide a composition for washing hair or cleansing scalp including no sulfate-based surfactant and having excellent bubbling capability and turbidity.

【Technical Solution】

To accomplish the above-mentioned object, the present disclosure provides a composition for washing hair or cleansing scalp, including: an anionic surfactant; and a cationic polymer, wherein the anionic surfactant includes an isethionate-based anionic surfactant.

【Advantageous Effects】

According to the present disclosure, it is possible to provide a composition for washing hair or cleansing scalp, including no sulfate-based surfactant and having excellent bubbling capability and turbidity.

【Description of Drawings】

FIG. 1 to FIG. 6 are graphs illustrating the foam volume, foam size and turbidity determined for each of Examples and Comparative Example.

5

【Best Mode】

The terms used herein are selected as general terms used currently and widely, while considering the functions thereof in the present disclosure, but may be varied with the intention of those skilled in the art, a precedent, appearance of novel technology, or the like. In addition, in a particular case, terms selected optionally by the present applicant are used. In this case, the meanings of such terms are described in detail in the following description. Therefore, the terms used in the present disclosure should be defined based on the meanings thereof and the contents throughout the present disclosure.

15 Unless otherwise defined, all terms, including technical and scientific terms, used herein have the same meanings as understood generally by those skilled in the art. Such generally understood terms should be interpreted as the same meanings corresponding to technical aspects of the present disclosure, and are not interpreted as ideal or excessively formal meanings, unless otherwise stated.

20

The numeral ranges used herein include numbers defined in the present disclosure. All maximum numeral limits given throughout the specification include all lower numeral limits, as if the lower numeral limits are written clearly. All minimum numeral limits given throughout the specification include all higher

numeral limits, as if the higher numeral limits are written clearly. All numeral ranges given throughout the specification include all better numeral ranges within broader numeral ranges, as if the narrower numeral ranges are written clearly.

5 Hereinafter, the present disclosure will be described in detail with reference to Examples and accompanying drawings. However, the scope of the present disclosure is not limited to the following Examples and drawings.

As used herein, the terms “comprising”, “having” or “including” have inclusive or open meanings and do not preclude the presence of additional non-mentioned elements, means or steps. The term “or a combination thereof”
10 used herein refers to any permutation and combination of items listed in advance to the term. For example, the expression “A, B, C or a combination thereof” covers at least one of A, B, C, AB, AC, BC and ABC, and BA, CA, CB, CBA, BCA, ACB, BAC and CAB, when the order is important in a specific
15 context. In addition to this, the expression clearly covers a combination including repetition of one or more items or terms, such as BB, AAA, MB, BBC, AAABCCC, CBAAAA or CABABB. It will be apparent to those skilled in the art that the number of items or terms is not typically limited in any combination, unless otherwise stated.

20 In one aspect of the present disclosure, there is provided a sulfate-free composition for washing hair or cleansing scalp, including: an anionic surfactant; and a cationic polymer, wherein the anionic surfactant includes an isethionate-based anionic surfactant.

Herein, the term “hair” may be “living” one, and in other words, may be

present on the living body. Particularly, the hair may be mammal or human hair. In a variant, the "hair" may be "non-living" one, and in other words, may be present on a wig, hair piece or another assembly of non-living keratin fibers. Particularly, the hair may be present on wool, fur and other keratin-containing
5 fibers. Therefore, the term "hair" may be used interchangeably with the term "hair fiber".

The expression "sulfate-free" means that the composition is substantially free from a sulfate-based surfactant. In addition, "substantially free from a sulfate-based surfactant" means that the composition includes a sulfate-based
10 surfactant in an amount of less than 1 wt%, preferably less than 0.1 wt%, and more preferably 0 wt%, based on the total weight of the composition.

The term "washing/cleansing" means removing various bodily waste, such as sweat, sebum, dust and aged dead skin cells, and makeup and contaminants from the hair and/or scalp surface, and covers "defatting
15 (cleansing)", and "washing" as its narrow meaning.

According to an embodiment of the present disclosure, the content of the isethionate-based anionic surfactant may be 0.6-5.9 wt% based on the total weight of the composition. More particularly, the content of isethionate-based anionic surfactant may be more than 0.5 wt%, 0.6 wt% or more, 0.7 wt% or
20 more, 0.75 wt% or more, 1 wt% or more, 1.25 wt% or more, 1.5 wt% or more, 1.75 wt% or more, 2 wt% or more, 2.25 wt% or more, 2.5 wt% or more, 2.75 wt% or more, or 3 wt% or more; and less than 6 wt%, 5.9 wt% or less, 5.85 wt% or less, 5.8 wt% or less, 5.75 wt% or less, 5.5 wt% or less, 5.25 wt% or less, 5 wt% or less, 4.75 wt% or less, 4.5 wt% or less, 4.25 wt% or less, 4 wt% or less,

3.75 wt% or less, 3.5 wt% or less, or 3 wt% or less, but is not limited thereto.

The content of the cationic polymer may be 0.06-0.54 wt% based on the total weight of the composition. More particularly, the content of the cationic polymer may be more than 0.05 wt%, 0.06 wt% or more, 0.07 wt% or more, 0.08 wt% or more, 0.09 wt% or more, 0.1 wt% or more, 0.15 wt% or more, 0.2 wt% or more, or 0.25 wt% or more; and less than 0.55 wt%, 0.54 wt% or less, 0.53 wt% or less, 0.52 wt% or less, 0.51 wt% or less, 0.5 wt% or less, 0.45 wt% or less, 0.4 wt% or less, 0.35 wt% or less, 0.3 wt% or less, or 0.25 wt% or less, but is not limited thereto.

According to an embodiment of the present disclosure, the ratio of the content of the isethionate-based anionic surfactant to the content of the cationic polymer may be 1 : 0.02-0.18 on the weight basis. More particularly, the weight ratio may be larger than 1 : 0.0167, 1 : 0.02 or more, 1 : 0.03 or more, 1 : 0.033 or more, 1 : 0.04 or more, 1 : 0.045 or more, 1 : 0.05 or more, 1 : 0.055 or more, 1 : 0.06 or more, 1 : 0.065 or more, 1 : 0.07 or more, 1 : 0.075 or more, 1 : 0.08 or more, or 1 : 0.083 or more; and less than 1 : 0.183, 1 : 0.18 or less, 1 : 0.17 or less, 1 : 0.16 or less, 1 : 0.15 or less, 1 : 0.14 or less, 1 : 0.13 or less, 1 : 0.12 or less, 1 : 0.11 or less, 1 : 0.1 or less, 1 : 0.09 or less, or 1 : 0.083 or less.

According to an embodiment of the present disclosure, the isethionate-based anionic surfactant is an ingredient having high biodegradability and used for alleviating irritation. According to an embodiment of the present disclosure, the isethionate-based anionic surfactant may be sodium cocoyl isethionate, sodium lauroyl isethionate, sodium myristoyl isethionate, sodium oleoyl

isethionate, or a mixture thereof. According to an embodiment of the present disclosure, the isethionate-based anionic surfactant may be sodium cocoyl isethionate, sodium lauroyl isethionate or a mixture thereof.

According to an embodiment of the present disclosure, the composition
5 includes a cationic polymer, and particular examples of the cationic polymer include Polyquaternium-2, Polyquaternium-4, Polyquaternium-6, Polyquaternium-7, Polyquaternium-10, Polyquaternium-11, Polyquaternium-16, Polyquaternium-17, Polyquaternium-18, Polyquaternium-22, Polyquaternium-24, Polyquaternium-28, Polyquaternium-32, Polyquaternium-37, Polyquaternium-39,
10 Polyquaternium-43, Polyquaternium-44, Polyquaternium-46, Polyquaternium-47, Polyquaternium-51, guar hydroxypropyltrimonium chloride and hydroxypropyl guar hydroxypropyltrimonium chloride. According to an embodiment of the present disclosure, the cationic polymer may be Polyquaternium-22, preferably.

According to an embodiment of the present disclosure, the composition
15 may further include an amphoteric surfactant. According to an embodiment of the present disclosure, the content of the amphoteric surfactant may be 5-10 wt% based on the total weight of the composition. More particularly, the content of the amphoteric surfactant may be more than 4.67 wt%, 5 wt% or more, 5.25 wt% or more, 5.5 wt% or more, 5.75 wt% or more, 6 wt% or more,
20 6.25 wt% or more, 6.5 wt% or more, 6.75 wt% or more, or 7 wt% or more; and less than 10.5 wt%, 10.25 wt% or less, 10 wt% or less, 9.75 wt% or less, 9.5 wt% or less, 9.25 wt% or less, 9 wt% or less, 8.75 wt% or less, 8.5 wt% or less, 8.4 wt% or less, 8.25 wt% or less, 8 wt% or less, 7.75 wt% or less, 7.5 wt% or less, 7.25 wt% or less, or 7 wt% or less, but is not limited thereto.

According to an embodiment of the present disclosure, the ratio of the content of the isethionate-based anionic surfactant to the content of the amphoteric surfactant may be 1 : 1.6-3.3 on the weight basis. More particularly, the weight ratio may be more than 1 : 1.5567, 1 : 1.6 or more, 1 : 1.65 or more, 1 : 1.7 or more, 1 : 1.75 or more, 1 : 1.8 or more, 1 : 1.85 or more, 1 : 1.9 or more, 1 : 1.95 or more, 1 : 2 or more, 1 : 2.05 or more, 1 : 2.1 or more, 1 : 2.15 or more, 1 : 2.2 or more, 1 : 2.25 or more, 1 : 2.3 or more, or 1 : 2.33 or more; and less than 1 : 3.5, 1 : 3.4 or less, 1 : 3.3 or less, 1 : 3.2 or less, 1 : 3.1 or less, 1 : 3 or less, 1 : 2.9 or less, 1 : 2.8 or less, 1 : 2.7 or less, 1 : 2.6 or less, 1 : 2.5 or less, 1 : 2.4 or less, or 1 : 2.33 or less, but is not limited thereto.

The amphoteric surfactant may be at least one amphoteric surfactant selected from the group consisting of a sultaine-based amphoteric surfactant (sulfobetaine-based amphoteric surfactant), a betaine-based amphoteric surfactant and an amphotoacetate-based amphoteric surfactant.

The amphoteric surfactant may be a sultaine-based amphoteric surfactant having a sulfo group (SO_3^-) at the end of the anion side. More particularly, the sultaine-based amphoteric surfactant may be cocamidopropyl hydroxysultaine, coco-hydroxysultaine, coco-sultaine, erucamidopropyl hydroxysultaine, hydroxysultaine, lauramidopropyl hydroxysultaine, lauryl hydroxysultaine, lauryl sultaine, methoxycinnamidopropyl hydroxysultaine, myristamidopropyl hydroxysultaine, oleamidopropyl hydroxysultaine, tallowamidopropyl hydroxysultaine, or a mixture thereof. According to an embodiment of the present disclosure, the amphoteric surfactant may be lauryl hydroxysultaine, preferably.

The amphoteric surfactant may be a betaine-based amphoteric surfactant having a COO⁻ group at the end of the anion side. More particularly, the betaine-based amphoteric surfactant may be cocamidopropyl betaine, coco betaine, coco dimethyl carboxymethyl betaine, lauryl dimethyl carboxymethyl betaine, lauryl dimethyl- α -carboxyethyl betaine, cetyl dimethyl carboxymethyl betaine, lauryl bis-(2-hydroxyethyl) carboxymethyl betaine, stearyl-bis-(2-hydroxypropyl) carboxymethyl betaine, oleyl dimethyl- γ -carboxypropyl betaine, lauryl bis-(2-hydroxypropyl) α -carboxyethyl betaine, coco dimethyl sulfopropyl betaine, stearyl dimethyl sulfopropyl betaine, cocoamido dimethyl carboxymethyl betaine, cocoamido dimethyl sulfopropyl betaine, laurylamido dimethyl carboxymethyl betaine, cetylamido dimethyl carboxymethyl betaine, stearylamido dimethyl sulfopropyl betaine, or a mixture thereof.

The amphoteric surfactant may be an amphoacetate-based amphoteric surfactant. More particularly, the amphoacetate-based amphoteric surfactant may include sodium lauroamphoacetate, sodium cocoamphoacetate, sodium mango amphoacetate, sodium shea butter amphoacetate, sodium sweet almond amphoacetate, sodium olive amphoacetate, sodium cocoa butter amphoacetate, sodium cotton seed amphoacetate, sodium argan amphoacetate, disodium lauroamphodiacetate, disodium cocoamphoacetate and disodium cocoamphodiacetate.

According to an embodiment of the present disclosure, the anionic surfactant contained in the composition may further include an amino acid-based anionic surfactant, a carboxylate-based anionic surfactant or a mixture

thereof.

The amino acid-based anionic surfactant is a natural anionic surfactant that provides excellent cleaning power and causes low irritation to the scalp or hair. For example, the amino acid-based anionic surfactant may be derived from alkylation and acylation of α -amino acids, such as alanine, arginine, aspartic acid, glutamic acid, glycine, isoleucine, leucine, lysin, phenyl alanine, serine, tyrosine and valine. Typical examples of N-acyl amino acid surfactants include: carboxylate salts (e.g. sodium, potassium, ammonium and TEA) of N-acylated glycine, such as sodium cocoyl glycinate and potassium cocoyl glycinate; sulfonate salts (e.g. sodium, potassium, ammonium and TEA) of N-alkylated taurine, such as potassium cocoyl taurate, potassium methyl cocoyl taurate, sodium caproyl methyl taurate, sodium cocoyl taurate, sodium lauroyl taurate, sodium methyl cocoyl taurate, sodium methyl lauroyl taurate, sodium methyl myristoyl taurate, sodium methyl oleoyl taurate, sodium methyl palmitoyl taurate and sodium methyl stearoyl taurate; carboxylate salts (e.g. sodium, potassium, ammonium and TEA) of N-acylated alanine, such as sodium cocoyl alaninate and TEA lauroyl alaninate; mono- and di-carboxylate salts (e.g. sodium, potassium, ammonium and TEA) of N-acylated glutamic acid, such as sodium cocoyl glutamate, sodium lauroyl glutamate, sodium myristoyl glutamate, sodium palmitoyl glutamate, sodium stearoyl glutamate, disodium cocoyl glutamate, disodium stearoyl glutamate, potassium cocoyl glutamate, potassium lauroyl glutamate and potassium myristoyl glutamate; and carboxylate salts (e.g. sodium, potassium, ammonium and TEA) of N-acylated sarcosine, such as sodium lauroyl sarcosinate, sodium cocoyl sarcosinate, sodium myristoyl

sarcosinate, sodium oleoyl sarcosinate and ammonium lauroyl sarcosinate.

According to an embodiment of the present disclosure, the amino acid-based anionic surfactant may be potassium cocoyl glycinate, sodium methyl cocoyl taurate, sodium cocoyl alaninate or a mixture thereof, preferably.

5 Particular examples of the carboxylate-based anionic surfactant include glycol carboxylate, amidoether carboxylate (AEC) and polyoxyethylene carboxylic acid salt. The glycol carboxylate-type anionic surfactant may be alkyl glycol carboxylate, 2-(2-hydroxyalkyloxy acetate) or a mixture thereof. The alkyl glycol carboxylate may include C8-C18 linear, branched, saturated or
10 non-saturated, aliphatic and/or aromatic alkyl chains. Particular examples of the glycol carboxylate-type anionic surfactant may include sodium lauryl glycol carboxylate and sodium 2-(2-hydroxyalkyloxy acetate). Particular examples of the amidoether carboxylate (AEC) include sodium lauryl amidoether carboxylate (3EO). Particular examples of the polyoxyethylene carboxylic acid salt include
15 oxyethylene (6EO) sodium lauryl ether carboxylate (C12-14-16 65/25/10), olive oil-derived polyoxyethylene and carboxymethyl fatty acid, and oxyethylene (6EO) sodium tridecyl ether carboxylate. According to an embodiment of the present disclosure, the carboxylate-based anionic surfactant may be sodium lauryl glycol carboxylate, preferably.

20 According to an embodiment of the present disclosure, the anionic surfactant may further include a sulfosuccinate-based anionic surfactant, an alpha-olefin sulfonate-based anionic surfactant or a mixture thereof, and the composition may further include an amphoteric surfactant. According to an embodiment of the present disclosure, the anionic surfactant includes an

isethionate-based anionic surfactant; an amino acid-based anionic surfactant, a carboxylate-based anionic surfactant or a mixture thereof; and a sulfosuccinate-based anionic surfactant, an alpha-olefin sulfonate-based anionic surfactant or a mixture thereof.

5 According to an embodiment of the present disclosure, the sulfosuccinate-based anionic surfactant may be disodium laureth sulfosuccinate, disodium lauryl sulfosuccinate or a mixture thereof. According to an embodiment of the present disclosure, the sulfosuccinate-based anionic surfactant may be disodium laureth sulfosuccinate, disodium lauryl
10 sulfosuccinate or a mixture thereof, preferably, and may be disodium laureth sulfosuccinate, more preferably.

When alpha-olefin synthesized in the petrochemical industry is sulfonated with anhydrous sulfuric acid, a mixture of alkene sulfonate with sultone is produced. When the product is neutralized with alkali, alkene
15 sulfonate is converted into sodium alkene sulfonate, a part of sultone is neutralized to be converted into sodium alkane disulfonate, and the remaining part of sultone is converted into sodium hydroxyalkane sulfonate. Therefore, the final product is a mixture including 64-72% of sodium alkene sulfonate, 21-26% of sodium hydroxyalkane sulfonate, 7-11% of sodium alkane disulfonate
20 and the other byproducts. This is an alpha-olefin sulfonate-based anionic surfactant. Among them, sodium alkane disulfonate is a material that is not helpful to cleansing, and sodium alkene sulfonate shows slightly higher cleaning power as compared to sodium hydroxyalkane sulfonate. However, when the two ingredients, sodium alkene sulfonate and sodium hydroxyalkane sulfonate,

are mixed suitably, it is possible to obtain higher cleaning power as compared to each ingredient alone. The alpha-olefin sulfonate shows high cleaning effect, hard water resistance and biodegradability, causes low skin irritation, and thus is used widely as an active ingredient. As an example of alpha-olefin sulfonate salt, sodium alpha-olefin sulfonate is represented by the structural formula of $(R \cdot CH=CHCH_2SO_3 \cdot Na + R \cdot CHOHCH_2CH_2SO_3 \cdot Na)$, wherein R has 10-18 carbon atoms.

According to an embodiment of the present disclosure, the content of the sulfosuccinate-based anionic surfactant, alpha-olefin sulfonate-based anionic surfactant or a mixture thereof may be 2-22 wt% based on the total weight of the composition. More particularly, the content may be 2 wt% or more, 3 wt% or more, 4 wt% or more, 5 wt% or more, 6 wt% or more, 7 wt% or more, 8 wt% or more, 9 wt% or more, 10 wt% or more, 11 wt% or more, or 12 wt% or more; and 22 wt% or less, 21 wt% or less, 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, or 12 wt% or less, but is not limited thereto.

According to an embodiment of the present disclosure, the ratio of the content of the amphoteric surfactant to the content of the anionic surfactant may be 1 : 2.1- 4.4 on the weight basis. More particularly, the content ratio may be more than 1 : 2, 1 : 2.1 or more, 1 : 2.2 or more, 1 : 2.3 or more, 1 : 2.4 or more, 1 : 2.5 or more, 1 : 2.6 or more, 1 : 2.7 or more, 1 : 2.8 or more, 1 : 2.9 or more, or 1 : 3 or more; and less than 1 : 4.5, 1 : 4.4 or less, 1 : 4.3 or less, 1 : 4.2 or less, 1 : 4.1 or less, 1 : 4 or less, 1 : 3.9 or less, 1 : 3.8 or less, 1 : 3.7 or less, 1 : 3.6 or less, 1 : 3.5 or less, 1 : 3.4 or less, 1 : 3.3 or less, 1 : 3.2 or less, 1 : 3.1 or

less, or 1 : 3 or less, but is not limited thereto.

According to an embodiment of the present disclosure, the composition may be formulated by the conventional method. For the formulation, reference will be made to the description in International Cosmetic Ingredient Dictionary
5 (INCI) published by The Cosmetic, Toiletry and Fragrance Association of USA.

Particularly, the composition may be formulated into hair rinse, shampoo, hair conditioner, hair pack, hair oil, hair treatment, hair cream, hair lotion, hair gel, hair essence, hair spray, hair serum, hair ampoule, makeup remover, cleanser, skin softener, emulsion, cream, essence, or the like. The formulation
10 may be a rinse-off type or wash-off type formulation which is rinsed after being applied to the hair; or a leave-on or leave-in type formulation which remains on the hair after being applied thereto.

If necessary, the composition may further include adjuvants used conventionally in the cosmetic or dermatology field depending on the quality or
15 function of a finished product, and the adjuvants may include fat substances, organic solvents, solvating agents, concentrating agents, gelling agents, softening agents, antioxidants, pH modifiers, water, ionic or non-ionic emulsifiers, fillers, metal ion sequestering agents, chelating agents, preservatives, protecting agents, wetting agents, essence oil, dyes, pigments
20 and hydrophilic or oleophilic activating agents used conventionally in the art, and other ingredients used conventionally in cosmetics.

In another aspect of the present disclosure, there is provided use of an anionic surfactant and a cationic polymer for the preparation of a sulfate-free composition for washing hair or cleansing scalp, wherein the anionic surfactant

is an isethionate-based anionic surfactant.

In still another aspect of the present disclosure, there is provided a method for washing hair or cleansing scalp, including a step of applying a composition including an anionic surfactant and a cationic polymer to a subject in need thereof, wherein the anionic surfactant is an isethionate-based anionic surfactant.

In yet another aspect of the present disclosure, there is provided an anionic surfactant and a cationic polymer for use in washing hair or cleansing scalp, wherein the anionic surfactant is an isethionate-based anionic surfactant.

Hereinafter, the present disclosure will be explained in more detail with reference to Examples. The following examples are for illustrative purposes only, and it will be apparent to those skilled in the art that the scope of the present disclosure is not limited thereto.

<Reference Example 1> Names and Trade Names of Ingredients

Used in Examples

The ingredients having the names described in the following Table 1 were used in Examples.

[Table 1]

Ingredient	INCI	Trade Name
Sulfosuccinat e-based anionic	Disodium Laureth Sulfosuccinate	Miconate LES(B)

surfactant		
Isethionate-based anionic surfactant	Sodium Cocoyl Isethionate	Jordapon SCI Powder
	Sodium Lauroyl Isethionate	Pureact SLI
	Sodium Lauroyl Methyl Isethionate	Iselux® LQ- CLR-SB
	Sodium Isethionate	Sigma- aldrich
Amino acid-based anionic surfactant	Potassium Cocoyl Glycinate	MIAMI PCG
	Sodium Lauroyl Sarcosinate	MIAMI L-30
	Sodium Methyl Cocoyl Taurate	MIAMI CMT
	Disodium Cocoyl Glutamate	Amisoft ECS-22W
	Sodium Cocoyl Alaninate	MIAMI PCG
Carboxylate-based anionic surfactant	Sodium Lauryl Glycol Carboxylate	Beaulight SHAA
Amphoteric surfactant	Lauryl Hydroxysultaine	AMPHITOL 20HD
Cationic polymer	Guar Hydroxypropyltrimonium Chloride	Guarquat L80KC
	Hydroxypropyl Guar hydroxypropyltrimonium Chloride	ESAFLOR HCT

	Polyquarternium-10	UCARE JR-30M
	Polyquarternium-7	Merquat 550
	Polyquaternium-22	Merquat 295

<Reference Example 2> Methods for Evaluating Bubbling Capability and Turbidity of Composition

In the following Test Examples, bubbling capability was evaluated by allowing 50 mL of each prepared shampoo composition to generate bubbles at a rate of 3500 rpm for 1 minute by using a propeller instrument of Dynamic Foam Analyzer (DFA100, KRUSS), and then measuring the foam volume (unit: mL) and foam size (unit: μm^2) for the generated bubbles. In general, when a composition generates 100 mL or more of foam, users feel that it has a lot of bubbles during use. When a composition generates bubbles having a size of 8500 μm^2 or less, users feel that it is dense during use. Meanwhile, in the following Test Examples, the turbidity was determined in a photobox equipped with a light emitting diode (unit: Nephelometry Turbidity Unit, NTU). In general, when a composition has a turbidity of 7 NTU or less, it can be regarded as a transparent formulation, when observed by the naked eyes.

<Test Example 1> Evaluation of Bubbling Capability and Turbidity of Composition Depending on Content of Isethionate-Based Anionic Surfactant

1. Preparation of Ingredients

According to the formulation as shown in the following Table 2, shampoo compositions were prepared by the conventional method (unit: wt%). Then, each prepared shampoo composition was diluted with purified water, and 50 mL of each 1/50 diluted shampoo composition was used for the evaluation.

5 [Table 2]

Ingredient	Comp. Ex. 1	Ex. 2	Ex. 3	Ex. 1	Ex. 4	Ex. 5
Distilled water	To 100	To 100	To 100	To 100	To 100	To 100
Disodium laureth sulfosuccinate	12	12	12	12	12	12
Sodium cocoyl isethionate	0	0.5	1	3	5	6
Potassium cocoyl glycinate	6	6	6	6	6	6
Lauryl hydroxysultaine	7	7	7	7	7	7
Polyquaternium-22	0.25	0.25	0.25	0.25	0.25	0.25
Citric acid monohydrate	0.3	0.3	0.3	0.3	0.3	0.3

2. Results of Evaluation of Bubbling Capability and Turbidity

The foam volume (unit: mL), foam size (unit: μm^2) and turbidity (unit: NTU) determined for each of Examples and Comparative Example are shown in the following Table 3 and FIG. 1.

10

[Table 3]

Item	Comp. Ex. 1	Ex. 2	Ex. 3	Ex. 1	Ex. 4	Ex. 5

Foam volume	74	120	117	109	102	81
Foam size	11,800	10,552	8,233	7,546	6,912	6,744
Turbidity	3	5	4	5	5	90

It can be seen from Table 3 and FIG. 1 that each of Examples 1, 3 and 4 containing sodium cocoyl isethionate as an isethionate-based anionic surfactant in a preferred range of content shows a relatively large foam volume and small foam size, and thus has a lot of dense bubbles. It can be also seen that each of Examples 1, 3 and 4 shows excellent bubbling capability and forms a transparent formulation.

<Test Example 2> Evaluation of Bubbling Capability of

Composition Depending on Type of Isethionate-Based Anionic Surfactant

1. Preparation of Ingredients

According to the formulation as shown in the following Table 4, shampoo compositions were prepared by the conventional method (unit: wt%). Then, each prepared shampoo composition was diluted with purified water, and 50 mL of each 1/50 diluted shampoo composition was used for the evaluation.

[Table 4]

Ingredient	Ex. 1	Ex. 6	Ex. 7	Ex. 8
Distilled water	To 100	To 100	To 100	To 100
Disodium laureth sulfosuccinate	12	12	12	12
Sodium cocoyl isethionate	3	-	-	-

Sodium lauroyl isethionate	-	3	-	-
Sodium lauroyl methyl isethionate	-	-	3	-
Sodium isethionate	-	-	-	3
Potassium cocoyl glycinate	6	6	6	6
Lauryl hydroxysultaine	7	7	7	7
Polyquaternium-22	0.25	0.25	0.25	0.25
Citric acid monohydrate	0.3	0.3	0.3	0.3

2. Results of Evaluation of Bubbling Capability

The foam volume (unit: mL) and foam size (unit: μm^2) determined for each of Examples and Comparative Example are shown in the following Table 5 and FIG. 2.

[Table 5]

Item	Ex. 1	Ex. 6	Ex. 7	Ex. 8
Foam volume	109	111	122	76
Foam size	7,546	7,622	11,125	11,542

It can be seen from Table 5 and FIG. 2 that each of Example 1 containing sodium cocoyl isethionate and Example 6 containing sodium lauroyl isethionate, as an isethionate-based anionic surfactant, shows a relatively large foam volume and small foam size, and thus has a lot of dense bubbles.

<Test Example 3> Evaluation of Bubbling Capability and Turbidity

of Composition Depending on Type of Cationic Polymer

1. Preparation of Ingredients

According to the formulation as shown in the following Table 6, shampoo compositions were prepared by the conventional method (unit: wt%).

- 5 Then, each prepared shampoo composition was diluted with purified water, and 50 mL of each 1/50 diluted shampoo composition was used for the evaluation.

[Table 6]

Ingredient	Ex. 1	Ex. 9	Ex. 10	Ex. 11	Ex. 12
Distilled water	To 100	To 100	To 100	To 100	To 100
Disodium laureth sulfosuccinate	12	12	12	12	12
Sodium cocoyl isethionate	3	3	3	3	3
Potassium cocoyl glycinate	6	6	6	6	6
Lauryl hydroxysultaine	7	7	7	7	7
Polyquaternium-22	0.25	-	-	-	-
Polyquaternium-7	-	0.25	-	-	-
Polyquaternium-10	-	-	0.25	-	-
Hydroxypropyl guar hydroxypropyltrimonium chloride	-	-	-	0.25	-
Guar hydroxypropyltrimonium chloride	-	-	-	-	0.25
Citric acid monohydrate	0.3	0.3	0.3	0.3	0.3

2. Results of Evaluation of Bubbling Capability and Turbidity

The foam volume (unit: mL), foam size (unit: μm^2) and turbidity (unit: NTU) determined for each of Examples and Comparative Example are shown in the following Table 7 and FIG. 3.

[Table 7]

Item	Ex. 1	Ex. 9	Ex. 10	Ex. 11	Ex. 12
Foam volume	109	78	49	42	44
Foam size	7,546	7,656	6,676	6,898	7,012
Turbidity	5	40	150	200	230

It can be seen from Table 7 and FIG. 3 that Example 1 containing Polyquaternium-22 as a cationic polymer shows a relatively large foam volume and small foam size, and thus has a lot of dense bubbles. It can be also seen that Example 1 shows excellent bubbling capability and forms a transparent formulation.

<Test Example 4> Evaluation of Bubbling Capability of Composition Depending on Content of Cationic Polymer

1. Preparation of Ingredients

According to the formulation as shown in the following Table 8, shampoo compositions were prepared by the conventional method (unit: wt%). Then, each prepared shampoo composition was diluted with purified water, and 50 mL of each 1/50 diluted shampoo composition was used for the evaluation.

[Table 8]

Ingredient	Ex. 13	Ex. 14	Ex. 1	Ex. 15	Ex. 16
Distilled water	To 100	To 100	To 100	To 100	To 100
Disodium laureth sulfosuccinate	12	12	12	12	12
Sodium cocoyl isethionate	3	3	3	3	3
Potassium cocoyl glycinate	6	6	6	6	6
Lauryl hydroxysultaine	7	7	7	7	7
Polyquaternium-22	0.05	0.1	0.25	0.5	0.55
Citric acid monohydrate	0.3	0.3	0.3	0.3	0.3

2. Results of Evaluation of Bubbling Capability

The foam volume (unit: mL) and foam size (unit: μm^2) determined for each of Examples and Comparative Example are shown in the following Table 9 and FIG. 4.

[Table 9]

Item	Ex. 13	Ex. 14	Ex. 1	Ex. 15	Ex. 16
Foam volume	76	100	109	107	90
Foam size	8,712	8,002	7,546	7,112	6,583

It can be seen from Table 9 and FIG. 4 that each of Examples 1, 14 and 15 containing Polyquaternium-22 as a cationic polymer in a preferred range of content shows a relatively large foam volume and small foam size, and thus has a lot of dense bubbles. It can be also seen that each of Examples 1, 14 and 15 shows excellent bubbling capability and forms a transparent formulation.

**<Test Example 5> Evaluation of Bubbling Capability and Turbidity
of Composition Depending on Content of Amphoteric Surfactant**

1. Preparation of Ingredients

According to the formulation as shown in the following Table 10,
5 shampoo compositions were prepared by the conventional method (unit: wt%).
Then, each prepared shampoo composition was diluted with purified water, and
50 mL of each 1/50 diluted shampoo composition was used for the evaluation.

[Table 10]

Ingredient	Ex. 17	Ex. 18	Ex. 1	Ex. 19	Ex. 20
Distilled water	To 100	To 100	To 100	To 100	To 100
Disodium laureth sulfosuccinate	12	12	12	12	12
Sodium cocoyl isethionate	3	3	3	3	3
Potassium cocoyl glycinate	6	6	6	6	6
Lauryl hydroxysultaine	4.67	5.25	7	8.4	10.5
Polyquaternium-22	0.25	0.25	0.25	0.25	0.25
Citric acid monohydrate	0.3	0.3	0.3	0.3	0.3

10 Meanwhile, the weight ratio of the amphoteric surfactant (lauryl
hydroxysultaine) to the anionic surfactant (disodium laureth sulfosuccinate,
sodium cocoyl isethionate and potassium cocoyl glycinate) for each Example is
shown in the following Table 11.

[Table 11]

Item	Ex. 17	Ex. 18	Ex. 1	Ex. 19	Ex. 20
------	--------	--------	-------	--------	--------

Weight ratio of amphoteric surfactant : anionic surfactant	1 : 4.5	1 : 4	1 : 3	1 : 2.5	1 : 2
---	---------	-------	-------	---------	-------

2. Results of Evaluation of Bubbling Capability and Turbidity

The foam volume (unit: mL), foam size (unit: μm^2) and turbidity (unit: NTU) determined for each of Examples and Comparative Example are shown in the following Table 12 and FIG. 5.

[Table 12]

Item	Ex. 17	Ex. 18	Ex. 1	Ex. 19	Ex. 20
Foam volume	84	101	109	111	112
Foam size	9,210	7,998	7,546	7,624	7,321
Turbidity	3	5	5	7	110

It can be seen from Table 12 and FIG. 5 that Examples 1, 18 and 19 containing lauryl hydroxysultaine as an amphoteric surfactant in a preferred range of content and further containing the anionic surfactant at a preferred weight ratio of the amphoteric surfactant to the anionic surfactant shows a relatively large foam volume and small foam size, and thus has a lot of dense bubbles. It can be also seen that each of Examples 1, 18 and 19 shows excellent bubbling capability and forms a transparent formulation.

<Test Example 6> Evaluation of Bubbling Capability and Turbidity of Composition Depending on Types of Amino Acid-Based Anionic Surfactant and Carboxylate-Based Anionic Surfactant

1. Preparation of Ingredients

According to the formulation as shown in the following Table 13, shampoo compositions were prepared by the conventional method (unit: wt%). Then, each prepared shampoo composition was diluted with purified water, and 50 mL of each 1/50 diluted shampoo composition was used for the evaluation.

[Table 13]

Ingredient	Ex. 1	Ex. 21	Ex. 22	Ex. 23	Ex. 24	Ex. 25
Distilled water	To 100	To 100	To 100	To 100	To 100	To 100
Disodium laureth sulfosuccinate	12	12	12	12	12	12
Sodium cocoyl isethionate	3	3	3	3	3	3
Potassium cocoyl glycinate	6	-	-	-	-	-
Sodium lauroyl sarcosinate	-	6	-	-	-	-
Sodium methyl cocoyl taurate	-	-	6	-	-	-
Disodium cocoyl glutamate	-	-	-	6	-	-
Sodium cocoyl alaninate	-	-	-	-	6	-
Sodium lauryl glycol carboxylate	-	-	-	-	-	6
Lauryl hydroxysultaine	7	7	7	7	7	7

Polyquaternium-22	0.25	0.25	0.25	0.25	0.25	0.25
Citric acid monohydrate	0.3	0.3	0.3	0.3	0.3	0.3

2. Results of Evaluation of Bubbling Capability

The foam volume (unit: mL) and foam size (unit: μm^2) determined for each of Examples and Comparative Example are shown in the following Table 14 and FIG. 6.

[Table 14]

Item	Ex. 1	Ex. 21	Ex. 22	Ex. 23	Ex. 24	Ex. 25
Foam volume	109	76	134	79	115	117
Foam size	7,546	6,997	7,964	7,243	7,892	7,356

It can be seen from Table 14 and FIG. 6 that each of Example 1 containing potassium cocoyl glycinate as an amino acid-based anionic surfactant, Example 22 containing sodium methyl cocoyl taurate as an amino acid-based surfactant and Example 24 containing sodium cocoyl alaninate as an amino acid-based surfactant, and Example 25 containing sodium lauryl glycol carboxylate as a carboxylate-based anionic surfactant shows a relatively large foam volume and small foam size, and thus has a lot of dense bubbles.

Hereinafter, Formulation Examples of the composition according to the present disclosure will be described. However, the composition may be applied to the other different formulations, the following Formulation Examples are illustrative purposes only, and the scope of the present disclosure is not

limited thereto.

[Formulation Example 1] Shampoo

Shampoo was obtained by the conventional method according to the
5 composition as shown in the following Table 15.

[Table 15]

Ingredient	Content (wt%)
Disodium laureth sulfosuccinate	12
Sodium cocoyl isethionate	3
Potassium cocoyl glycinate	6
Lauryl hydroxysultaine	7
Polyquaternium-22	0.25
Citric acid monohydrate	0.3
Preservative	0.03
Purified water	Balance
Fragrance	0.5

[Formulation Example 2] Rinse

Rinse was obtained by the conventional method according to the
10 composition as shown in the following Table 16.

[Table 16]

Ingredient	Content (wt%)
Disodium laureth sulfosuccinate	12

Sodium cocoyl isethionate	3
Potassium cocoyl glycinate	6
Lauryl hydroxysultaine	7
Polyquaternium-22	0.25
Citric acid monohydrate	0.3
Hydroxyethyl cellulose	1.0
Propylene glycol	4.0
Preservative	0.03
Purified water	Balance
Fragrance	0.5

[Formulation Example 3] Balm

Balm was obtained by the conventional method according to the composition as shown in the following Table 17.

5 [Table 17]

Ingredient	Content (wt%)
Disodium laureth sulfosuccinate	12
Sodium cocoyl isethionate	3
Potassium cocoyl glycinate	6
Lauryl hydroxysultaine	7
Polyquaternium-22	0.25
Citric acid monohydrate	0.3
Squalane	1.0

Ceteraryl alcohol	1.5
Bees wax	4.0
Preservative	0.03
Purified water	Balance
Fragrance	0.5

The present disclosure relates to at least the following embodiments and covers the following embodiments.

[Embodiment 1] A sulfate-free composition for washing hair or
5 cleansing scalp, including: an anionic surfactant; and a cationic polymer,
wherein the anionic surfactant includes an isethionate-based anionic surfactant.

[Embodiment 2] The sulfate-free composition for washing hair or
cleansing scalp as defined in Embodiment 1, wherein the content of the
isethionate-based anionic surfactant is 0.6-5.9 wt% based on the total weight of
10 the composition.

[Embodiment 3] The sulfate-free composition for washing hair or
cleansing scalp as defined in Embodiment 1 or 2, wherein the content of the
cationic polymer is 0.06-0.54 wt% based on the total weight of the composition.

[Embodiment 4] The sulfate-free composition for washing hair or
15 cleansing scalp as defined in any one of Embodiments 1 to 3, wherein the ratio
of the content of the isethionate-based anionic surfactant to the content of the
cationic polymer is 1 : 0.02-0.18 on the weight basis.

[Embodiment 5] The sulfate-free composition for washing hair or
cleansing scalp as defined in any one of Embodiments 1 to 4, wherein the

isethionate-based anionic surfactant is sodium cocoyl isethionate, sodium lauroyl isethionate or a mixture thereof.

[Embodiment 6] The sulfate-free composition for washing hair or cleansing scalp as defined in any one of Embodiments 1 to 5, wherein the cationic polymer is Polyquaternium-22.

[Embodiment 7] The sulfate-free composition for washing hair or cleansing scalp as defined in any one of Embodiments 1 to 6, which further includes an amphoteric surfactant, and the content of the amphoteric surfactant is 5-10 wt% based on the total weight of the composition.

[Embodiment 8] The sulfate-free composition for washing hair or cleansing scalp as defined in Embodiment 7, wherein the ratio of the content of the isethionate-based anionic surfactant to the content of the amphoteric surfactant is 1 : 1.6-3.3 on the weight basis.

[Embodiment 9] The sulfate-free composition for washing hair or cleansing scalp as defined in Embodiment 7, wherein the amphoteric surfactant is at least one amphoteric surfactant selected from the group consisting of a sultaine-based amphoteric surfactant, a betaine-based amphoteric surfactant and an amphoacetate-based amphoteric surfactant.

[Embodiment 10] The sulfate-free composition for washing hair or cleansing scalp as defined in Embodiment 7, wherein the amphoteric surfactant is lauryl hydroxysultaine.

[Embodiment 11] The sulfate-free composition for washing hair or cleansing scalp as defined in any one of Embodiments 1 to 10, wherein the anionic surfactant further includes at least one anionic surfactant selected from

the group consisting of an amino acid-based anionic surfactant, a carboxylate-based anionic surfactant, a sulfosuccinate-based anionic surfactant and an alpha-olefin sulfonate-based anionic surfactant.

[Embodiment 12] The sulfate-free composition for washing hair or
5 cleansing scalp as defined in Embodiment 11, wherein the amino acid-based anionic surfactant is potassium cocoyl glycinate, sodium methyl cocoyl taurate, sodium cocoyl alaninate or a mixture thereof.

[Embodiment 13] The sulfate-free composition for washing hair or
cleansing scalp as defined in Embodiment 11, wherein the carboxylate-based
10 anionic surfactant is sodium lauryl glycol carboxylate.

[Embodiment 14] The sulfate-free composition for washing hair or
cleansing scalp as defined in Embodiment 11, wherein the sulfosuccinate-based anionic surfactant is disodium laureth sulfosuccinate, disodium lauryl sulfosuccinate or a mixture thereof.

15 **[Embodiment 15]** The sulfate-free composition for washing hair or
cleansing scalp as defined in Embodiment 11, wherein the anionic surfactant includes an amino acid-based anionic surfactant, a carboxylate-based anionic surfactant and a sulfosuccinate-based anionic surfactant.

[Embodiment 16] The sulfate-free composition for washing hair or
20 cleansing scalp as defined in Embodiment 15, which further includes an amphoteric surfactant, and the ratio of the content of the amphoteric surfactant to the content of the anionic surfactant is 1 : 2.1-4.4 on the weight basis.

It should be understood that the above-described embodiments are

given by way of illustration only and the scope of the present disclosure is not limited to the above detailed description. In addition, the scope of the present disclosure is defined by the following claims, and various changes, modifications and substitutions within the scope of the present disclosure will
5 become apparent to those skilled in the art. Therefore, it is apparent to those skilled in the art that such modifications and changes fall within the scope of the present disclosure.

【CLAIMS】

【Claim 1】

A sulfate-free composition for washing hair or cleansing scalp, comprising: an anionic surfactant; and a cationic polymer, wherein the anionic
5 surfactant comprises an isethionate-based anionic surfactant.

【Claim 2】

The sulfate-free composition for washing hair or cleansing scalp according to claim 1, wherein the content of the isethionate-based anionic
10 surfactant is 0.6-5.9 wt% based on the total weight of the composition.

【Claim 3】

The sulfate-free composition for washing hair or cleansing scalp according to claim 1, wherein the content of the cationic polymer is 0.06-0.54
15 wt% based on the total weight of the composition.

【Claim 4】

The sulfate-free composition for washing hair or cleansing scalp according to claim 2, wherein the ratio of the content of the isethionate-based
20 anionic surfactant to the content of the cationic polymer is 1 : 0.02-0.18 on the weight basis.

【Claim 5】

The sulfate-free composition for washing hair or cleansing scalp according to claim 1, wherein the isethionate-based anionic surfactant is sodium cocoyl isethionate, sodium lauroyl isethionate or a mixture thereof.

5 **【Claim 6】**

The sulfate-free composition for washing hair or cleansing scalp according to claim 1, wherein the cationic polymer is Polyquaternium-22.

【Claim 7】

10 The sulfate-free composition for washing hair or cleansing scalp according to claim 1, which further comprises an amphoteric surfactant, and the content of the amphoteric surfactant is 5-10 wt% based on the total weight of the composition.

15 **【Claim 8】**

The sulfate-free composition for washing hair or cleansing scalp according to claim 7, wherein the ratio of the content of the isethionate-based anionic surfactant to the content of the amphoteric surfactant is 1 : 1.6-3.3 on the weight basis.

20

【Claim 9】

The sulfate-free composition for washing hair or cleansing scalp

according to claim 7, wherein the amphoteric surfactant is at least one amphoteric surfactant selected from the group consisting of a sultaine-based amphoteric surfactant, a betaine-based amphoteric surfactant and an amphoacetate-based amphoteric surfactant.

5

【Claim 10】

The sulfate-free composition for washing hair or cleansing scalp according to claim 7, wherein the amphoteric surfactant is lauryl hydroxysultaine.

10

【Claim 11】

The sulfate-free composition for washing hair or cleansing scalp according to claim 1, wherein the anionic surfactant further comprises at least one anionic surfactant selected from the group consisting of an amino acid-based anionic surfactant, a carboxylate-based anionic surfactant, a sulfosuccinate-based anionic surfactant and an alpha-olefin sulfonate-based anionic surfactant.

15

【Claim 12】

The sulfate-free composition for washing hair or cleansing scalp according to claim 11, wherein the amino acid-based anionic surfactant is potassium cocoyl glycinate, sodium methyl cocoyl taurate, sodium cocoyl alaninate or a mixture thereof.

20

【Claim 13】

The sulfate-free composition for washing hair or cleansing scalp according to claim 11, wherein the carboxylate-based anionic surfactant is
5 sodium lauryl glycol carboxylate.

【Claim 14】

The sulfate-free composition for washing hair or cleansing scalp according to claim 11, wherein the sulfosuccinate-based anionic surfactant is
10 disodium laureth sulfosuccinate, disodium lauryl sulfosuccinate or a mixture thereof.

【Claim 15】

The sulfate-free composition for washing hair or cleansing scalp
15 according to claim 11, wherein the anionic surfactant includes an amino acid-based anionic surfactant, a carboxylate-based anionic surfactant and a sulfosuccinate-based anionic surfactant.

【Claim 16】

20 The sulfate-free composition for washing hair or cleansing scalp according to claim 15, which further comprises an amphoteric surfactant, and the ratio of the content of the amphoteric surfactant to the content of the anionic surfactant is 1 : 2.1-4.4 on the weight basis.