

SPECIFICATION

HAIR CLEANSING AGENT COMPOSITION

5 FIELD OF THE INVENTION

[0001]

The present invention relates to a hair cleansing agent composition.

RELATED ART

10 [0002]

Hairs are damaged by chemical treatments such as hair colors or permanent waves or heat treatments such as driers or irons. In the damaged hair, since the hair friction is increased, the hair is easily entangled, the hair surface is physically damaged when entangled, and thus the hair is further damaged.

In order to reduce such physical damage during a hair care behavior and resolve worries caused by the damage, a cationic polymer or an oil agent such as silicone is occasionally blended into a hair cleansing agent. However, there is a concern that the hair after drying becomes sticky or a sense of use is degraded when the blending amount is extremely increased in order to increase these blending effects.

25 [0003]

Under the above-described circumstances, it is suggested that a non-stickiness after drying and a good sense of use be

both achieved by blending specific cationized hydroxypropyl cellulose.

For example, Japanese Patent Laid-Open No. 2012-232945 describes a technique of using a combination of cationized hydroxypropyl cellulose and at least one compound selected from cationized guar gum and cationized hydroxyethyl cellulose, and, discloses a hair cosmetic composition having an excellent finger combing smoothness or softness at a time of rinsing and an excellent finger combing smoothness, setting property, softness, and sense of tension or firmness at a time of drying. [0004]

In addition, Japanese Patent Laid-Open No. 2012-246288 describes a technique related to an aqueous hair cleansing agent composition which contains an anionic surfactant, specific cationized hydroxypropyl cellulose, a specific organic solvent, and a specific organic carboxylic acid and has a pH in a specific range. According to the aqueous hair cleansing agent composition described in the same document, it is possible to effectively suppress an entanglement of the hair and a spread of the hair after drying and to provide a tension or firmness for the hair even in a case of a damaged hair. [0005]

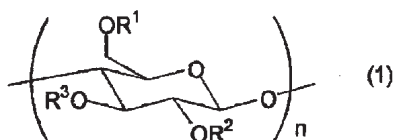
Further, International Publication No. WO2011/059063 describes a hair cosmetic composition containing a surfactant and specific cationized hydroxypropyl cellulose as a technique related to a hair cosmetic composition which is not sticky

after the use and is capable of providing an excellent finger combing smoothness, coating feeling, and setting property for the hair.

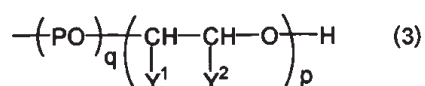
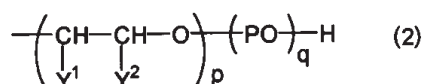
5 SUMMARY OF THE INVENTION

[0006]

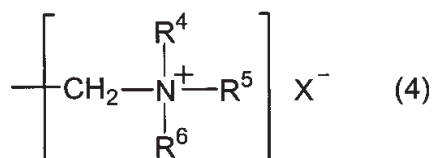
In one embodiment, there is provided a hair cleansing agent composition containing: a component (A) that is a cationized hydroxy propyl cellulose which has a main chain
 10 derived from anhydroglucose represented by a following General Formula (1), has a substitution degree by a cationized ethyleneoxy group of equal to or greater than 0.01 and equal to or less than 2.9, and has a substitution degree by a propyleneoxy group of equal to or greater than 0.1 and equal
 15 to or less than 4.0; a component (B) that is a cationic polymer other than the component (A); a component (C) that is a sulfate type surfactant; a component (D) that is a carboxylate type surfactant; and water, in which a mass ratio ((C)/(A)) of the content of the component (C) to the content
 20 of the component (A) is equal to or greater than 26 and equal to or less than 20000, and a mass ratio ((C)/(D)) of the content of the component (C) to the content of the component (D) is equal to or greater than 4 and equal to or less than 200.



(In the General Formula (1), R^1 , R^2 , and R^3 each independently represent a substituent represented by a following General Formula (2) or (3) and n represents an average polymerization degree of the anhydroglucose, which is a number equal to or greater than 50 and equal to or less than 5000.)



(In the General Formulae (2) and (3), one of Y^1 and Y^2 represents a hydrogen atom and the other represents a cationic group represented by a following General Formula (4), PO represents a propyleneoxy group, p represents a number of cationized ethyleneoxy groups ($-\text{CH}(Y^1)-\text{CH}(Y^2)-\text{O}-$), q represents a number of propyleneoxy groups ($-\text{PO}-$), p and q each independently represent 0 or a positive integer, where all p 's and q 's in R^1 , R^2 , and R^3 do not represent 0 at the same time, and in a case where both of p and q do not represent 0, the order of adding the cationized ethyleneoxy group and the propyleneoxy group is not limited, and in a case where both of p and q do not represent 0 and one or both of p and q represent an integer of 2 or greater, a block bond or a random bond may be provided.)



(In the General Formula (4), R^4 , R^5 , and R^6 each independently represent a linear or branched alkyl group having equal to or more than 1 and equal to or less than 3 carbon atoms, and X^- represents an anionic group.)

5

DETAILED DESCRIPTION OF THE INVENTION

[0007]

The present invention will be now described herein with reference to illustrative embodiments. Those skilled in the art will recognize that many alternative embodiments can be accomplished using the teachings of the present invention and that the present invention is not limited to the embodiments illustrated for explanatory purposes.

[0008]

Hair hydrophilized due to a damage is unlikely to be dried after washing so that it takes a long time to dry the hair with a drier or the like and this results in a physical burden on the consumer. Further, an oil agent or a polymer blended for a purpose of damage care causes a stickiness during a drying with a drier. Because of this stickiness, a damaged wet hair is easily entangled and a catching occurring during the drying with a drier leads to accumulation of a further damage and a psychological burden on consumers.

[0009]

However, there is no suggestion related to the speed of drying a wet hair after washing in Japanese Patent Laid-Open No. 2012-232945, Japanese Patent Laid-Open No. 2012-246288,

and International Publication No. WO2011/059063. There is also no suggestion related to non-stickiness of the hair at the time of drying the wet hair in these documents. Further, the entanglement and setting property of the hair after drying are improved by the techniques described in these documents, but there is still room for improvement in non-entanglement of hair at the time of rinsing or setting property of hair after drying.

[0010]

10 Accordingly, the present invention relates to a hair cleansing agent composition which makes a wet hair after washing be dried in a short time, makes the hair difficult to entangle at the time of rinsing, is smooth to touch, makes the hair non-sticky during drying, and makes the hair be settled after drying.

[0011]

In another embodiment, there is provided a method of washing a hair including: applying the hair cleansing agent composition according to the present invention to the hair; and rinsing the hair with water.

[0012]

25 According to the present invention, it is possible to provide a hair cleansing agent composition which makes the wet hair after washing be dried in a short time, makes the hair difficult to entangle at the time of rinsing, is smooth to touch, makes the hair non-sticky during drying, and makes the hair be settled after drying.

[0013]

Hereinafter, embodiments of the present invention will be described in detail with reference to examples of each component. Further, each component may be used alone or in
5 combination of two or more kinds thereof.

A hair cleansing agent composition of the present embodiment contains the following components (A) to (D) and water.

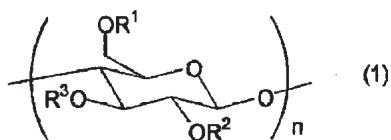
[0014]

10 (Component (A))

The component (A) is the cationized hydroxy propyl cellulose (hereinafter, also referred to as "C-HPC") which has a main chain derived from anhydroglucose represented by the General Formula (1), has a substitution degree by a cationized
15 ethyleneoxy group of equal to or greater than 0.01 and equal to or less than 2.9, and has a substitution degree by a propyleneoxy group of equal to or greater than 0.1 and equal to or less than 4.0.

[0015]

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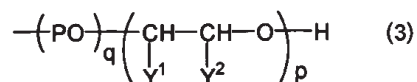
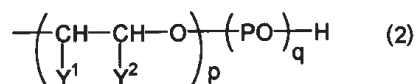


[0016]

(In the General Formula (1), R^1 , R^2 , and R^3 each independently represent a substituent represented by the following General Formula (2) or (3) and n represents an
25 average polymerization degree of the anhydroglucose, which is

a number equal to or greater than 50 and equal to or less than 5000.)

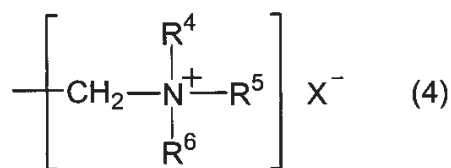
[0017]



5 [0018]

(In the General Formulae (2) and (3), one of Y^1 and Y^2 represents a hydrogen atom and the other represents a cationic group represented by the following General Formula (4), and PO represents a propyleneoxy group. p represents the number of cationized ethyleneoxy groups $(-\text{CH}(\text{Y}^1) - \text{CH}(\text{Y}^2) - \text{O}-)$, q represents the number of propyleneoxy groups $(-\text{PO}-)$, and p and q each independently represent 0 or a positive integer. Here, all p's and q's in R^1 , R^2 , and R^3 do not represent 0 at the same time. In a case where both of p and q do not represent 0, the order of adding the cationized ethyleneoxy group and the propyleneoxy group is not limited. In a case where both of p and q do not represent 0 and one or both of p and q represent an integer of 2 or greater, a block bond or a random bond may be provided.)

20 [0019]



[0020]

(In the General Formula (4), R^4 , R^5 , and R^6 each independently represent a linear or branched alkyl group having equal to or more than 1 and equal to or less than 3 carbon atoms, and X^- represents an anionic group.)

5 [0021]

(Main chain derived from anhydroglucose represented by the General Formula (1))

The component (A) has a main chain derived from anhydroglucose represented by the General Formula (1).

10 [0022]

In the General Formula (1), R^1 , R^2 , and R^3 each independently represent a substituent represented by the General Formula (2) or (3), R^1 , R^2 , and R^3 may be the same as or different from each other. Further, n R^1 's, n R^2 's, and n R^3 's may be the same as or different from each other.

[0023]

From the viewpoints of increasing a quick drying effect of the hair, suppressing the entanglement of the hair at the time of rinsing so that the hair becomes smooth to touch, suppressing stickiness during drying, and improving a settling feeling of the hair after drying, an average polymerization degree n in the General Formula (1) is 50 or greater, preferably 100 or greater, more preferably 400 or greater, still more preferably 700 or greater. Further, the average polymerization degree n in the General Formula (1) is 5000 or less, preferably 2000 or less, and more preferably 1300 or less.

Here, the average polymerization degree indicates the viscosity average polymerization degree measured by a copper-ammonia method, specifically, a method described in Japanese Patent Laid-Open No. 2012-232942.

5 [0024]

(Substituent represented by the General Formula (2) or (3))

The component (A) includes a cationized ethyleneoxy group and a propyleneoxy group in R^1 , R^2 , or R^3 of the General
10 Formula (1). R^1 , R^2 , and R^3 each independently represent a substituent represented by the General Formula (2) or (3).

[0025]

In the General Formulae (2) and (3), one of Y^1 and Y^2 represents a hydrogen atom and the other represents a cationic
15 group represented by the following General Formula (4), and PO represents a propyleneoxy group.

p represents the number of cationized ethyleneoxy groups ($-\text{CH}(Y^1)-\text{CH}(Y^2)-\text{O}-$) in the General Formula (2) or (3), which is 0 or a positive integer. From the viewpoint of improving a
20 producibility of the component (A), it is preferable that p represents 0 or 1.

q represents the number of propyleneoxy groups ($-\text{PO}-$) in the General Formula (2) or (3), which is 0 or a positive integer. From the viewpoint of improving the producibility of
25 the component (A), q represents preferably an integer equal to or greater than 0 and equal to or less than 4, more preferably an integer equal to or greater than 0 and equal to or less

than 2, and still more preferably 0 or 1.

In a case where a plurality of substituents represented by the General Formula (2) or (3) are present in a molecule of the C-HPC, p and q may be different from each other between
5 the substituents.

[0026]

From the viewpoint of improving the producibility of the component (A), the total number of p and q is preferably equal to or greater than 1 and equal to or less than 5, more
10 preferably equal to or greater than 1 and equal to or less than 4, still more preferably equal to or greater than 1 and equal to or less than 3, and even still more preferably 1 or 2.

In the General Formula (2) or (3), in a case where both of p and q do not represent 0, the order of adding the
15 cationized ethyleneoxy group and the propyleneoxy group is not limited, but the order described in the General Formula (3) is preferable from the viewpoint of improving a production efficiency of the component (A).

Further, in a case where both of p and q do not represent
20 0 and one or both of p and q represent an integer of 2 or greater, a bond between the cationized ethyleneoxy group and the propyleneoxy group may be a block bond or a random bond, but a block bond is preferable from the viewpoint of improving the producibility of the component (A).

25 In addition, all p's and q's in R^1 , R^2 , and R^3 do not represent 0 at the same time. In other words, p of the General Formula (2) or (3) does not represent 0 in at least one of n

R^1 's, $n R^2$'s, and $n R^3$'s. Also, q of the General Formula (2) or (3) does not represent 0 in at least one of $n R^1$'s, $n R^2$'s, and $n R^3$'s.

[0027]

5 (Cationic group represented by the General Formula (4))

The cationic group as Y^1 and Y^2 in the General Formula (2) or (3) has a structure represented by the General Formula (4).

[0028]

In the General Formula (4), R^4 , R^5 , and R^6 each
10 independently represent a linear or branched alkyl group
having equal to or more than 1 and equal to or less than 3
carbon atoms, and specific examples thereof include a methyl
group, an ethyl group, an n-propyl group, and an isopropyl
group. Among these, from the viewpoint of improving a water
15 solubility of the C-HPC, a methyl group or an ethyl group is
preferable and a methyl group is more preferable.

In the General Formula (4), X^- represents an anionic
group which is a counter ion of an ammonium group. X^- is not
limited as long as the group represented by X^- is an anionic
20 group. Specific examples of X^- include an alkyl sulfate ion, a
sulfate ion, a phosphate ion, an alkyl carbonate ion, and a
halide ion. Among these, from the viewpoint of facilitating a
production of the C-HPC, a halide ion is preferable. Examples
of the halide ion include a fluoride ion, a chloride ion, a
25 bromide ion, and an iodide ion. Among these, from the
viewpoint of improving the water solubility of the C-HPC and a
chemical stability thereof, a chloride ion or a bromide ion is

preferable and a chloride ion is more preferable.

[0029]

In the C-HPC represented by the General Formula (1), from the viewpoints of improving a foaming at the time of washing, improving the quick drying effect of the hair, suppressing the entanglement of the hair at the time of rinsing so that the hair becomes smooth to touch, suppressing the stickiness during drying, and improving the settling feeling of hair after drying, the substitution degree of the cationized ethyleneoxy group is 0.01 or greater, preferably 0.1 or greater, more preferably 0.18 or greater. Further, the substitution degree thereof is 2.9 or less and preferably 2.4 or less.

Here, the substitution degree of the cationized ethyleneoxy group indicates the average molar number of the cationized ethyleneoxy group present in a molecule of the C-HPC per one mole of the anhydroglucose unit constituting a cellulose main chain. The substitution degree of the cationized ethyleneoxy group is measured by a method described in Japanese Patent Laid-Open No. 2012-232942.

[0030]

Further, in the C-HPC represented by the General Formula (1), from the viewpoints of an excellent foamability at the time of washing, providing a foam removability and an anti-foaming properties at the time of rinsing, improving the quick drying effect of hair, suppressing the entanglement of the hair at the time of rinsing so that the hair becomes smooth to

touch, suppressing the stickiness during drying, and improving the settling feeling of the hair after drying, the substitution degree of the propyleneoxy group is 0.1 or greater, preferably 0.2 or greater, more preferably 1.1 or greater, still more preferably 1.5 or greater, and even still more preferably 2.0 or greater. Further, the substitution degree thereof is 4.0 or less, preferably 3.0 or less, more preferably 2.9 or less, still more preferably 2.6 or less, and even still more preferably 2.4 or less.

Here, the substitution degree of the propyleneoxy group indicates the average molar number of the propyleneoxy group present in a molecule of the C-HPC per one mole of the anhydroglucose unit constituting a cellulose main chain. The substitution degree of the propyleneoxy group is measured by a method described in Japanese Patent Laid-Open No. 2012-232942. [0031]

The C-HPC of the component (A) is obtainable by the production method of (i) to (iii) described below.

(i) Method of mixing cellulose, a large amount of water, and an excessive amount of alkali metal hydroxide with each other in a slurry state and reacting the mixture with a cationizing agent and propylene oxide.

(ii) Method of adding amines and an alcoholate catalyst to a solvent, dissolving cellulose therein using a dimethylacetamide containing lithium chloride as the solvent, and reacting the solution with a cationizing agent and propylene oxide.

(iii) Method of reacting powdery, pellet-like, or chip-like cellulose, a cationizing agent, and propylene oxide in the coexistence of a base without using a large amount of water or a solvent as described in the above (i) and (ii).

5 In the production method of the above (i) to (iii), the reaction with the cationizing agent and the reaction with propylene oxide may be carried out sequentially or simultaneously.

10 In these production methods, from the viewpoint of improving the producibility of the component (A), the production method of the above (iii) is preferable.

More specifically, the C-HPC can be produced by a method described in Japanese Patent Laid-Open No. 2012-246288.

[0032]

15 From the viewpoints of improving the quick drying effect of the hair, suppressing the entanglement of the hair at the time of rinsing so that the hair becomes smooth to touch, suppressing the stickiness during drying, and improving the settling feeling of the hair after drying, the content of the
20 component (A) in the hair cleansing agent composition is preferably 0.001% by mass or greater, more preferably 0.003% by mass or greater, still more preferably 0.007% by mass or greater, even still more preferably 0.01% by mass, and even
25 still more preferably 0.03% by mass with respect to the total content of the hair cleansing agent composition. Further, from the same viewpoints as described above, the content of the component (A) in the hair cleansing agent composition is

preferably 1.5% by mass or less, more preferably 1.0% by mass or less, still more preferably 0.8% by mass or less, even still more preferably 0.6% by mass or less, even still more preferably 0.5% by mass or less, and even still more preferably 0.3% by mass or less with respect to the total content of the hair cleansing agent composition.

[0033]

(Component (B))

The component (B) is a cationic polymer other than the above-described component (A). Specific examples of the component (B) include a cationized cellulose derivative other than the component (A) such as cationized hydroxyethyl cellulose; cationized starch; cationized galactomannan such as cationized fenugreek gum, cationized guar gum, cationized tara gum, or cationized locust beam gum and derivatives of these; a copolymer such as a diallyl quaternary ammonium salt/acrylamide copolymer, a vinyl imidazolium trichloride/vinyl pyrrolidone copolymer, a hydroxyethyl cellulose/dimethyl diallyl ammonium chloride copolymer, a vinyl pyrrolidone/quaternized dimethylaminoethyl methacrylate copolymer, a polyvinylpyrrolidone/alkylamino acrylate copolymer, a polyvinylpyrrolidone/alkylamino acrylate/vinyl caprolactam copolymer, a vinyl pyrrolidone/methacrylamide propyl trimethyl ammonium chloride copolymer, an alkyl acrylamide/acrylate/alkylaminoalkyl acrylamide/polyethylene glycol methacrylate copolymer, an adipic acid/dimethylaminohydroxypropylethylenetriamine copolymer

(CARTARETIN, manufactured by Sandoz Inc. in US), cationic polymers described in Japanese Patent Laid-Open No. S53-139734, and cationic polymers described in Japanese Patent Laid-Open No. S60-36407.

5 [0034]

Among the examples described above, the cationized galactomannan is a water-soluble cationized polymer obtainable by introducing a quaternary nitrogen-containing group to galactomannan with the main chain whose constituent unit is
10 mannose and the side chain whose constituent unit is galactose. The galactomannan is obtainable from, for example, endosperm of seeds of a leguminous plant. A mixture of galactose and mannose at a mixing ratio of 1:1 is fenugreek gum, a mixture of galactose and mannose at a mixing ratio of 1:2 is guar gum,
15 a mixture of galactose and mannose at a mixing ratio of 1:3 is tara gum, and a mixture of galactose and mannose at a mixing ratio of 1:4 is locust bean gum.

In commercially available products of the cationized galactomannan, CATINAL CF-100 (manufactured by Toho Chemical
20 Industries Co., Ltd.) is exemplified as the cationized fenugreek gum. Examples of the commercially available products of the cationized guar gum include Jaguar Series such as JAGUAR C-13S, JAGUAR C-14S, JAGUAR C-14SK, and JAGUAR C-17 (manufactured by Solvay SA, guar hydroxypropyl triammonium
25 chloride). Further, examples of the commercially available products of the cationized tara gum include CATINAL CTR-100 and CATINAL CTR-200 (both manufactured by Toho Chemical

Industries Co., Ltd., Caesar pinia spinosa hydroxypropyl
 trimonium chloride). Further, examples of the commercially
 available products of the cationized locust beam gum include
 CATINAL CLB-100 (manufactured by Toho Chemical Industries Co.,
 5 Ltd., locust bean hydroxypropyl trimonium chloride).

[0035]

Further, specific examples of the commercially available
 products of the component (B) include, in addition to those
 described above, MERQUAT 100 (manufactured by Lubrizol Advance
 10 Materials, copolymer of diallyl dimethyl ammonium salt; INCI
 name: polyquaternium-6), MERQUAT 550 (manufactured by Lubrizol
 Advance Materials, copolymer of acrylamide and diallyl
 dimethyl ammonium salt; INCI name: polyquaternium-7), MERQUAT
 280 and 295 (manufactured by Lubrizol Advance Materials,
 15 copolymer of acrylic acid and diallyl dimethyl ammonium salt;
 INCI name: polyquaternium-22), LUVIQUAT FC370 (manufactured by
 BASF Corporation, copolymer of 1-vinyl-2-pyrrolidone and 1-
 vinyl-3-methylimidazolium salt; INCI name: polyquaternium-16),
 GAFQUAT 755N (manufactured by ISP Japan Ltd., copolymer of 1-
 20 vinyl-2-pyrrolidone and dimethylaminoethyl methacrylate; INCI
 name: polyquaternium-11), Ucare polymer JR and Ucare polymer
 LR Series (Amerchol, salt of reactant of trimethyl ammonium-
 substituted epoxide and hydroxyethyl cellulose; INCI name:
 polyquaternium-10), POISE C-60H, POISE C-80M, POISE C-150L
 25 (all manufactured by Kao Corp., salt of reactant of trimethyl
 ammonium-substituted epoxide and hydroxyethyl cellulose; INCI
 name: polyquaternium-10), and SOFCARE KG-101E (manufactured by

Kao Corp., INCI name: polyquaternium-52).

[0036]

From the viewpoints of improving the quick drying effect of the hair, suppressing the entanglement of the hair at the time of rinsing so that the hair becomes smooth to touch, suppressing the stickiness during drying, and improving the settling feeling of the hair after drying, it is preferable that the component (B) is at least one selected from the group consisting of cationized galactomannan, cationized hydroxyethyl cellulose (polyquaternium-10), cationized starch, polyquaternium-6, polyquaternium-7, polyquaternium-22, and polyquaternium-52, more preferable that the component (B) is at least one selected from the group consisting of cationized galactomannan, cationized hydroxyethyl cellulose, and cationized starch, and still more preferable that the component (B) is cationized galactomannan.

[0037]

From the viewpoints of suppressing the entanglement of the hair at the time of rinsing so that the hair becomes smooth to touch and improving the settling feeling of the hair after drying, the content of the component (B) in the hair cleansing agent composition is preferably 0.01% by mass or greater, more preferably 0.02% by mass or greater, and still more preferably 0.05% by mass or greater with respect to the total content of the hair cleansing agent composition. Further, from the viewpoints of improving the quick drying effect of the hair and suppressing the stickiness during drying, the

content of the component (B) in the hair cleansing agent composition is preferably 3% by mass or less, more preferably 2% by mass or less, still more preferably 1% by mass or less, even still more preferably 0.8% by mass, and even still more preferably 0.4% by mass or less with respect to the total content of the hair cleansing agent composition.

[0038]

In addition, from the viewpoints of improving the quick drying effect of the hair, suppressing the entanglement of the hair at the time of rinsing, suppressing the stickiness during drying, and improving the settling feeling of the hair after drying, the mass ratio ((A)/(B)) of the content of the component (A) to the content of the component (B) in the hair cleansing agent composition is preferably 0.001 or greater, more preferably 0.005 or greater, still more preferably 0.01 or greater, even still more preferably 0.03 or greater, even still more preferably 0.07 or greater, even still more preferably 0.12 or greater, even still more preferably 0.16 or greater, and even still more preferably 0.2 or greater.

Further, from the viewpoints of improving the quick drying effect of the hair and suppressing the entanglement of the hair at the time of rinsing so that the hair becomes smooth to touch, the mass ratio ((A)/(B)) is preferably 150 or less, more preferably 100 or less, still more preferably 50 or less, even still more preferably 10 or less, even still more preferably 6 or less, even still more preferably 3 or less, and even still more preferably 2 or less.

[0039]

Next, anionic surfactants of the component (C) and the component (D) will be described.

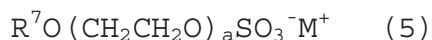
(Component (C))

5 The component (C) is a sulfate type surfactant.

Specific examples thereof of the component (C) include alkyl sulfate, alkenyl sulfate, polyoxyalkylene alkyl ether sulfate, polyoxyalkylene alkenyl ether sulfate, and sulfosuccinic acid alkylene alkyl phenyl ether sulfate.

10 [0040]

It is preferable that the component (C) is polyoxyethylene alkyl ether sulfate represented by a following General Formula (5).



15 (In the General Formula (5), R^7 represents an alkyl group or an alkenyl group having equal to or more than 8 and equal to or less than 18 carbon atoms, M^+ represents a cation derived from an alkali metal, an alkaline earth metal, ammonium, alkanolamine or a basic amino acid, and a represents an
20 average addition molar number of ethylene oxide, which is a value equal to or greater than 0.5 and equal to or less than 5.)

[0041]

From the viewpoints of achieving both of a quick foaming
25 and an excellent feeling of foam, a number of carbon atoms of R^7 in the General Formula (5) is preferably 8 or greater and more preferably 10 or greater. Further, the number thereof is

preferably 18 or less and more preferably 14 or less.

From the same viewpoints as described above, the average addition molar number a of the ethylene oxide in the General Formula (5) is preferably 0.5 or greater, more preferably 0.6 or greater, and still more preferably 0.8 or greater. Further, the average addition molar number a thereof is preferably 5 or less, more preferably 4 or less, and still more preferably 3.5 or less.

Further, from the same viewpoints as described above, it is preferable that M^+ which is a counter ion represents a cation derived from an alkali metal such as sodium or potassium; a cation derived from an alkaline earth metal such as calcium or magnesium; a cation derived from ammonium; a cation derived from alkanolamine such as monoethanolamine, diethanolamine, or triethanolamine; or a cation derived from a basic amino acid such as arginine or lysine and more preferable that M^+ represents a cation derived from ammonium or sodium.

From the same viewpoints as described above, it is preferable that the component (C) is polyoxyethylene alkyl ether sulfate in which M^+ represents a cation derived from ammonium or sodium and more preferable that the component (C) is at least one selected from ammonium laureth sulfate and sodium laureth sulfate.

[0042]

From the viewpoints of further improving foaming at the time of washing, improving the quick drying effect of the hair,

suppressing the entanglement of the hair at the time of rinsing so that the hair becomes smooth to touch, suppressing the stickiness during drying, and improving the settling feeling of the hair after drying, the content of the component (C) in the hair cleansing agent composition is preferably 3% by mass or greater, more preferably 5% by mass or greater, and still more preferably 8% by mass or greater with respect to the total content of the hair cleansing agent composition.

From the viewpoints of improving the foam removability and

suppressing the entanglement of the hair at the time of rinsing so that the hair becomes smooth to touch, the content of the component (C) in the hair cleansing agent composition is preferably 20% by mass or less, more preferably 18% by mass or less, and still more preferably 15% by mass or less with respect to the total content of the hair cleansing agent composition.

[0043]

From the viewpoints of improving the quick drying effect of hair, suppressing the entanglement of the hair at the time

of rinsing so that the hair becomes smooth to touch, suppressing the stickiness during drying, and improving the settling feeling of the hair after drying, the mass ratio

$((C)/(A))$ of the content of the component (C) to the content of the component (A) in the hair cleansing agent composition

is 26 or greater, preferably 30 or greater, more preferably 50 or greater, and still more preferably 100 or greater. Further, from the viewpoints of improving the quick drying effect of

the hair, suppressing the entanglement of the hair at the time of rinsing, suppressing the stickiness of the hair during drying, and improving the settling feeling of the hair after drying, the mass ratio ((C)/(A)) is 20000 or less, preferably 10000 or less, more preferably 5000 or less, still more preferably 3000 or less, even still more preferably 2000 or less, even still more preferably 1800 or less, even still more preferably 1500 or less, even still more preferably 1000 or less, and even still more preferably 500 or less.

10 [0044]

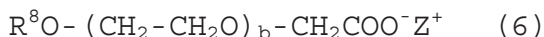
(Component (D))

The component (D) is a carboxylate type surfactant.

Specific examples of the carboxylate type surfactant include an ether carboxylate type anionic surfactant such as a polyoxyalkylene alkyl ether carboxylate and an amino acid surfactant.

[0045]

It is preferable that the component (D) is a polyoxyethylene alkyl ether carboxylate represented by a following General Formula (6).



(In the General Formula (6), R^8 represents an alkyl group or an alkenyl group having equal to or more than 10 and equal to or less than 18 carbon atoms, Z^+ represents a cation derived from an alkali metal, an alkaline earth metal, ammonium, alkanolamine or a basic amino acid, and b represents a mass average, which is a value equal to or greater than 0.5 and

equal to or less than 10.)

[0046]

In the General Formula (6), from the viewpoints of sufficiently obtaining effects of enriching foaming at the time of washing, suppressing the entanglement of the hair at the time of rinsing by combining the component (D) with the components (A) to (C) so that the hair becomes smooth to touch, suppressing the stickiness of the hair during drying, and improving the settling feeling of the hair after drying, a number of carbon atoms of R^8 is preferably 10 or greater and more preferably 12 or greater. Further, the number of carbon atoms thereof is preferably 18 or less and more preferably 16 or less.

In the General Formula (6), from the viewpoint of improving foaming, an average addition molar number b of ethylene oxide is preferably 0.5 or greater and more preferably 1 or greater in terms of mass (weight) average. Further, the average addition molar number b thereof is preferably 10 or less and more preferably 6 or less.

In addition, from the same viewpoints as described above, in the General Formula (6), it is preferable that Z^+ which is a counter ion represents a cation derived from an alkali metal such as sodium or potassium; a cation derived from an alkaline earth metal such as calcium or magnesium; a cation derived from ammonium; a cation derived from alkanolamine such as monoethanolamine, diethanolamine, or triethanolamine; or a cation derived from a basic amino acid such as arginine or

lysine and more preferable that Z^+ represents a cation derived from ammonium or sodium.

From the same viewpoints as described above, it is preferable that the component (D) is polyoxyethylene alkyl ether carboxylate in which Z^+ represents a cation derived from ammonium or sodium and more preferable that the component (D) is at least one selected from ammonium laureth carboxylate and sodium laureth carboxylate.

[0047]

From the viewpoints of improving the quick drying effect of the hair, suppressing the entanglement of the hair at the time of rinsing so that the hair becomes smooth to touch, and improving the settling feeling of the hair after drying, the content of the component (D) in the hair cleansing agent composition is preferably 0.1% by mass or greater, more preferably 0.3% by mass or greater, and still more preferably 0.5% by mass or greater with respect to the total content of the hair cleansing agent composition. From the viewpoints of suppressing the entanglement of hair at the time of rinsing so that the hair becomes smooth to touch, improving the settling feeling of hair after drying, suppressing the stickiness during drying and improving the quick drying effect of the hair, the content of the component (D) in the hair cleansing agent composition is preferably 10% by mass or less, more preferably 5% by mass or less, and still more preferably 2.5% by mass or less with respect to the total content of the hair cleansing agent composition.

[0048]

From the viewpoints of obtaining the excellent foaming, suppressing the entanglement of the hair at the time of rinsing so that the hair becomes smooth to touch, improving the settling feeling of the hair after drying, suppressing the stickiness during drying, and improving the quick drying effect of hair, the mass ratio $((C)/(D))$ of the content of the component (C) to the content of the component (D) in the hair cleansing agent composition is 4 or greater, preferably 6 or greater, and more preferably 8 or greater. Further, from the viewpoints of improving the quick drying effect of the hair, suppressing the entanglement of the hair at the time of rinsing so that the hair becomes smooth to touch, and improving the settling feeling of the hair after drying, the mass ratio $((C)/(D))$ is 200 or less, preferably 150 or less, more preferably 100 or less, still more preferably 80 or less, even still more preferably 50 or less, and even still more preferably 30 or less.

[0049]

From the viewpoints of improving the quick drying effect of the hair, suppressing the entanglement of the hair at the time of rinsing so that the hair becomes smooth to touch, suppressing the stickiness during drying, and improving the settling feeling of the hair after drying, the mass ratio $((C) + (D))/(A)$ of the total content of the component (C) and the component (D) to the content of the component (A) in the hair cleansing agent composition is preferably 6.8 or

greater, more preferably 25 or greater, still more preferably 30 or greater, even still more preferably 50 or greater, and even still more preferably 80 or greater. Further, from the viewpoints of suppressing the stickiness during drying,

5 improving the quick drying effect of the hair, and improving the settling feeling of the hair after drying, the mass ratio $((C) + (D))/(A)$ is preferably 25000 or less, more preferably 5000 or less, still more preferably 3000 or less, even still more preferably 2000 or less, even still more preferably 1800
10 or less, even still more preferably 1500 or less, even still more preferably 1200 or less, even still more preferably 1000 or less, and even still more preferably 500 or less.

[0050]

(Water)

15 The hair cleansing agent composition of the present embodiment contains water as a medium. As water, ion exchange water or distilled water can be used. The content of water is a residual amount of the components (A) to (D) and other components in the hair cleansing agent composition.

20 [0051]

Further, in the present embodiment, the hair cleansing agent composition may contain components other than the components described above.

For example, the hair cleansing agent composition may
25 further contain silicones as a component (E).

(Component (E))

Specific examples of the silicones of the component (E)

include dimethyl polysiloxane (hereinafter, also referred to as dimethicone), cyclic silicone, amino-modified silicone, dimethiconol, polyether-modified silicone, polyglycidol-modified silicone, methylphenyl polysiloxane, fatty acid-modified silicone, alcohol-modified silicone, alkoxy-modified silicone, epoxy-modified silicone, fluorine-modified silicone, and alkyl-modified silicone. Among these, from the viewpoints of the smoothness of the hair at the time of coating of the hair cleansing agent composition and rinsing and the performance of the quick drying of the hair, one or two or more selected from the group consisting of dimethyl polysiloxane and amino-modified silicone are preferable.

[0052]

From the viewpoints of suppressing an adhesion between hairs during drying to promote a separation so that the drying time is shortened and suppressing the entanglement of the hair at the time of rinsing so that the hair becomes smooth to touch, the content of the component (E) in the hair cleansing agent composition is preferably 0.01% by mass or greater, more preferably 0.05% by mass or greater, still more preferably 0.1% by mass or greater, and even still more preferably 0.3% by mass or greater with respect to the total content of the hair cleansing agent composition. From the viewpoints of suppressing the stickiness during drying, the content of the component (E) in the hair cleansing agent composition is preferably 15% by mass or less, more preferably 10% by mass or less, still more preferably 5% by mass or less, and even still

more preferably 3% by mass or less with respect to the total content of the hair cleansing agent composition.

[0053]

(Other optional components)

5 The hair cleansing agent composition of the present embodiment may suitably contain components typically used for a hair cleansing agent composition in addition to the components described above according to desired effects. Examples such optional components include anti-dandruff
10 agents; vitamins; fungicides; anti-inflammatory agents, for example, glycyrrhizic acid and a salt thereof such as dipotassium glycyrrhizinate and glycyrrhetinic acid and a salt thereof; preservatives such as benzoic acid and a salt thereof; chelating agents such as EDTA-2Na; humectants such as
15 sorbitol and panthenol; surfactants other than the components (C) and (D); colorants such as a dye and a pigment; extracts which may include an eucalyptus extract such as a polar solvent extract of eucalyptus, conchiolin or a hydrolysate thereof, protein obtainable from honey, royal jelly, silk or
20 hydrolyzates thereof, a protein-containing extract obtainable from seeds of legumes, Asian ginseng extract, rice germ extract, Fucus extract, aloe extract, lotus extract, pomegranate extract, eglantine extract, chamomilla extract, licorice extract, Alpinia speciosa leaf extract, and chlorella
25 extract; pearling agents such as titanium oxide; perfume; an ultraviolet absorber; an antioxidant; shea butter; rose water; sunflower oil; orange oil; and eucalyptus oil.

[0054]

(pH)

From the viewpoint of suppressing the entanglement of the hair at the time of rinsing so that the hair becomes smooth to touch, the pH of the hair cleansing agent composition of the present embodiment is preferably 4.0 or greater, more preferably 4.5 or greater, still more preferably 5.0 or greater. Further, the pH thereof is preferably 8.0 or less, more preferably 7.5 or less, and still more preferably 7.0 or less. In the present specification, the pH of the hair cleansing agent composition indicates a value measured (glass electrode measurement method) at 25°C when diluted with water at 20 mass times.

[0055]

Next, a method of producing the hair cleansing agent composition of the present embodiment will be described.

The hair cleansing agent composition of the present embodiment is produced by, for example, mixing the components (A) to (D) and other suitable components in predetermined order and dissolving or dispersing the mixture in water.

Specifically, the components (C) and (D) are added to water and the solution is heated at a temperature of approximately 80°C while the solution is stirred. Next, an aqueous solution obtained by dissolving or uniformly dispersing the components (A) and (B) in water in advance is added to the solution, and then the solution is stirred so that the contents are uniformly dissolved therein. Other

components are suitably added to the solution while the solution is cooled and then the solution is stirred so that the contents are uniformly dissolved therein and is cooled to room temperature (25°C, the same applies to hereinafter),
5 thereby obtaining a hair cleansing agent composition.

[0056]

Further, a method of washing the hair using the hair cleansing agent composition in the present embodiment includes, for example, applying the hair cleansing agent composition to
10 the hair, preferably coating the hair with the hair cleansing agent composition, foaming well, and then rinsing the hair with water.

[0057]

Since the hair cleansing agent composition of the present
15 embodiment contains the components (A) to (D) and water and the mass ratio ((C)/(A)) and the mass ratio ((C)/(D)) are respectively in a specific range, the wet hair after washing can be dried in a short time. Further, when the hair cleansing agent composition of the present embodiment is used, it is
20 possible to suppress the entanglement of the hair at the time of rinsing so that the hair becomes smooth to touch, suppress the stickiness at the time of drying, and provide the settling feeling for the hair after drying.

Further, according to the present embodiment, for example,
25 the hair cleansing agent composition can thinly adhere to the surface of the hair uniformly and thus the entanglement of hair from rinsing to drying can be suppressed and the settling

feeling of the hair after drying can be improved.

[0058]

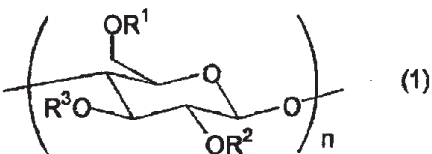
Hereinbefore, the embodiments of the present invention have been described, but these are merely examples and other
5 various configurations can be employed.

[0059]

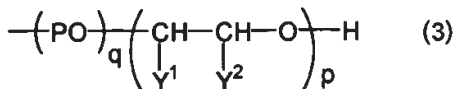
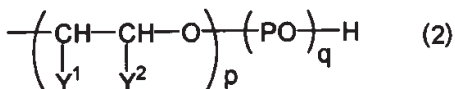
In regard to the above-described embodiments, preferred embodiments of the present invention will be further described below.

10 [0060]

<1> A hair cleansing agent composition containing: a component (A) that is a cationized hydroxy propyl cellulose which has a main chain derived from anhydroglucose represented by the following General Formula (1), has a substitution
15 degree by a cationized ethyleneoxy group of equal to or greater than 0.01 and equal to or less than 2.9, and has a substitution degree by a propyleneoxy group of equal to or greater than 0.1 and equal to or less than 4.0; a component (B) that is a cationic polymer other than the component (A); a
20 component (C) that is a sulfate type surfactant; a component (D) that is a carboxylate type surfactant; and water, in which a mass ratio ((C)/(A)) of the content of the component (C) to the content of the component (A) is equal to or greater than 26 and equal to or less than 20000, and a mass ratio ((C)/(D))
25 of the content of the component (C) to the content of the component (D) is equal to or greater than 4 and equal to or less than 200.

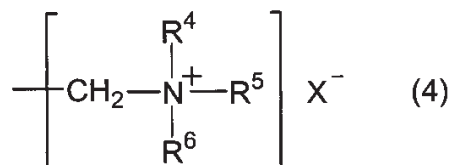


average polymerization degree of the anhydroglucose, which is a number equal to or greater than 50 and equal to or less than 5000.)



represents a hydrogen atom and the other represents a cationic group represented by the following General Formula (4), and PO represents a propyleneoxy group. p represents the number of cationized ethyleneoxy groups $(-\text{CH}(\text{Y}^1)-\text{CH}(\text{Y}^2)-\text{O}-)$, q represents the number of propyleneoxy groups $(-\text{PO}-)$, and p and q each independently represent 0 or a positive integer. Here, all p's and q's in R^1 , R^2 , and R^3 do not represent 0 at the same time. In a case where both of p and q do not represent 0, the order of adding the cationized ethyleneoxy group and the propyleneoxy group is not limited. In a case where both of p and q do not represent 0 and one or both of p and q represent an integer of 2 or greater, a block bond or a random bond may

be provided.)



(In the General Formula (4), R^4 , R^5 , and R^6 each independently represent a linear or branched alkyl group having equal to or more than 1 and equal to or less than 3 carbon atoms, and X^- represents an anionic group.)

[0061]

<2> The hair cleansing agent composition according to <1>, in which the content of the component (A) in the hair cleansing agent composition is preferably 0.001% by mass or greater, more preferably 0.003% by mass or greater, still more preferably 0.007% by mass or greater, even still more preferably 0.01% by mass or greater, and even still more preferably 0.03% by mass or greater and is preferably 1.5% by mass or less, more preferably 1.0% by mass or less, still more preferably 0.8% by mass or less, even still more preferably 0.6% by mass or less, even still more preferably 0.5% by mass or less, and even still more preferably 0.3% by mass or less with respect to the total content of the hair cleansing agent composition.

<3> The hair cleansing agent composition according to <1> or <2>, in which an average polymerization degree n of the component (A) in the General Formula (1) is preferably 50 or greater, more preferably 100 or greater, still more preferably 400 or greater, and even still more preferably 700 or greater

and is preferably 5000 or less, more preferably 2000 or less, and still more preferably 1300 or less.

<4> The hair cleansing agent composition according to any one of <1> to <3>, in which the substitution degree of the cationized ethyleneoxy group in the composition (A) is 0.01 or greater, preferably 0.1 or greater, and more preferably 0.18 or greater and is 2.9 or less and preferably 2.4 or less.

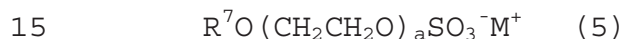
<5> The hair cleansing agent composition according to any one of <1> to <4>, in which the substitution degree of the propyleneoxy group in the composition (A) is 0.1 or greater, preferably 0.2 or greater, more preferably 1.1 or greater, still more preferably 1.5 or greater, and even still more preferably 2.0 or greater and is 4.0 or less, preferably 3.0 or less, more preferably 2.9 or less, still more preferably 2.6 or less, and even still more preferably 2.4 or less.

<6> The hair cleansing agent composition according to any one of <1> to <5>, in which the content of the component (B) in the hair cleansing agent composition is preferably 0.01% by mass or greater, more preferably 0.02% by mass or greater, and still more preferably 0.05% by mass or greater and is preferably 3% by mass or less, more preferably 2% by mass or less, still more preferably 1% by mass or less, even still more preferably 0.8% by mass or less, and even still more preferably 0.4% by mass or less with respect to the total content of the hair cleansing agent composition.

<7> The hair cleansing agent composition according to any one of <1> to <6>, in which the content of the component (C)

in the hair cleansing agent composition is preferably 3% by mass or greater, more preferably 5% by mass or greater, and still more preferably 8% by mass or greater and is preferably 20% by mass or less, more preferably 18% by mass or less, and
 5 still more preferably 15% by mass or less with respect to the total content of the hair cleansing agent composition.

<8> The hair cleansing agent composition according to any one of <1> to <7>, in which the component (C) is preferably polyoxyethylene alkyl ether sulfate represented by the
 10 following General Formula (5), more preferably polyoxyethylene alkyl ether sulfate in which M^+ in the following General Formula (5) represents ammonium or sodium, and still more preferably at least one selected from ammonium laureth sulfate and sodium laureth sulfate.

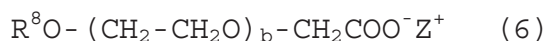


(In the General Formula (5), R^7 represents an alkyl group or an alkenyl group having equal to or more than 8 and equal to or less than 18 carbon atoms, M^+ represents a cation derived from an alkali metal, an alkaline earth metal, ammonium,
 20 alkanolamine or a basic amino acid, and a represents an average addition molar number of ethylene oxide, which is a value equal to or greater than 0.5 and equal to or less than 5.)

<9> The hair cleansing agent composition according to any
 25 one of <1> to <8>, in which the mass ratio $((C)/(A))$ of the content of the component (C) to the content of the component (A) in the hair cleansing agent composition is 26 or greater,

preferably 30 or greater, more preferably 50 or greater, and still more preferably 100 or greater and is 20000 or less, preferably 10000 or less, more preferably 5000 or less, still more preferably 3000 or less, even still more preferably 2000
 5 or less, even still more preferably 1800 or less, even still more preferably 1500 or less, even still more preferably 1000 or less, and even still more preferably 500 or less.

<10> The hair cleansing agent composition according to any one of <1> to <9>, in which the component (D) is
 10 preferably polyoxyethylene alkyl ether carboxylate represented by the following General Formula (6), more preferably polyoxyethylene alkyl ether carboxylate in which Z^+ in the following General Formula (6) represents ammonium or sodium, and more preferably at least one selected from ammonium
 15 laureth carboxylate and sodium laureth carboxylate.



(In the General Formula (6), R^8 represents an alkyl group or an alkenyl group having equal to or more than 10 and equal to or less than 18 carbon atoms, Z^+ represents a cation derived
 20 from an alkali metal, an alkaline earth metal, ammonium, alkanolamine or a basic amino acid, and b represents a mass average, which is a value equal to or greater than 0.5 and equal to or less than 10.)

<11> The hair cleansing agent composition according to
 25 any one of <1> to <10>, in which the content of the component (D) in the hair cleansing agent composition is preferably 0.1% by mass or greater, more preferably 0.3% by mass or greater,

and still more preferably 0.5% by mass or greater and is preferably 10% by mass or less, more preferably 5% by mass or less, and still more preferably 2.5% by mass or less with respect to the total content of the hair cleansing agent composition.

<12> The hair cleansing agent composition according to any one of <1> to <11>, in which the mass ratio $((C)/(D))$ of the content of the component (C) to the content of the component (D) in the hair cleansing agent composition is 4 or greater, preferably 6 or greater, and more preferably 8 or greater and is 200 or less, preferably 150 or less, more preferably 100 or less, still more preferably 80 or less, even still more preferably 50 or less, and even still more preferably 30 or less.

<13> The hair cleansing agent composition according to any one of <1> to <12>, in which the mass ratio $((C) + (D))/(A)$ of the total content of the component (C) and the component (D) to the content of the component (A) in the hair cleansing agent composition is preferably 6.8 or greater, more preferably 25 or greater, still more preferably 30 or greater, even still more preferably 50 or greater, and even still more preferably 80 or greater and is preferably 25000 or less, more preferably 5000 or less, still more preferably 3000 or less, even still more preferably 2000 or less, even still more preferably 1800 or less, even still more preferably 1500 or less, even still more preferably 1200 or less, even still more preferably 1000 or less, and even still more preferably 500 or

less.

<14> The hair cleansing agent composition according to any one of <1> to <13>, in which the mass ratio ((A)/(B)) of the content of the component (A) to the content of the component (B) in the hair cleansing agent composition is preferably 0.001 or greater, more preferably 0.005 or greater, still more preferably 0.01 or greater, even still more preferably 0.03 or greater, even still more preferably 0.07 or greater, even still more preferably 0.12 or greater, even still more preferably 0.16 or greater, and even still more preferably 0.2 or greater and is preferably 150 or less, more preferably 100 or less, still more preferably 50 or less, even still more preferably 10 or less, even still more preferably 6 or less, even still more preferably 3 or less, and even still more preferably 2 or less.

<15> The hair cleansing agent composition according to any one of <1> to <14>, in which the component (B) is preferably at least one selected from the group consisting of cationized galactomannan, cationized hydroxyethyl cellulose (polyquaternium-10), cationized starch, polyquaternium-6, polyquaternium-7, polyquaternium-22, and polyquaternium-52, more preferably at least one selected from the group consisting of cationized galactomannan, cationized hydroxyethyl cellulose, and cationized starch, and still more preferably cationized galactomannan.

<16> The hair cleansing agent composition according to any one of <1> to <15>, further containing silicones as a

component (E).

<17> The hair cleansing agent composition according to any one of <1> to <16>, in which the content of the component (E) in the hair cleansing agent composition is preferably
5 0.01% by mass or greater, more preferably 0.05% by mass or greater, still more preferably 0.1% by mass or greater, and even still more preferably 0.3% by mass or greater and is preferably 15% by mass or less, more preferably 10% by mass or less, still more preferably 5% by mass or less, and even still
10 more preferably 3% by mass or less with respect to the total content of the hair cleansing agent composition.

<18> The hair cleansing agent composition according to any one of <1> to <17>, in which the pH of the hair cleansing agent composition at 25°C when diluted with water at 20 mass
15 times is preferably 4.0 or greater, more preferably 4.5 or greater, still more preferably 5.0 or greater and is preferably 8.0 or less, more preferably 7.5 or less, and still more preferably 7.0 or less.

<19> A method of producing the hair cleansing agent
20 composition according to any one of <1> to <18>, including preferably a process of mixing the components (A) to (D) and other suitable components in predetermined order and dissolving or dispersing the mixture in water; and including more preferably a first step of adding the
25 components (C) and (D) to water and heating the solution at a temperature of approximately 80°C while stirring the solution, a second step of adding an aqueous solution obtained by

dissolving or uniformly dispersing the components (A) and (B) in water to the mixture obtained in the first step and stirring the solution so that the contents are uniformly dissolved therein, and a step of suitably adding other components to the mixture obtained in the second step while cooling the mixture, stirring the solution so that the contents are uniformly dissolved therein, and cooling the solution to 25°C, thereby obtaining the hair cleansing agent composition.

10 <20> A method of washing a hair including: applying the hair cleansing agent composition according to any one of <1> to <18> to the hair and rinsing the hair with water; and preferably including coating the hair with the hair cleansing agent composition according to any one of <1> to <18> and
15 rinsing the hair with water.

[Examples]

[0062]

<Examples 1 to 11 and Comparative Examples 1 to 6>

Shampoo compositions having the compositions listed in
20 Tables 1 and 2 were prepared and evaluations were performed according to the following method and the following criteria.

[0063]

[Method of preparing shampoo composition]

The components (C) and (D) were added to water, the
25 solution was heated at a temperature of approximately 80°C while the solution was stirred, an aqueous solution obtained by dissolving or uniformly dispersing the components (A) and

(B) in water in advance was added to the solution, and then the solution was stirred so that the contents are uniformly dissolved therein. Thereafter, the component (E) was added thereto while the mixture was cooled, the solution was stirred so that the contents were uniformly dissolved therein and was cooled to 25°C, and hydrochloric acid was suitably added thereto, thereby obtaining a shampoo composition having a pH value in the parentheses in Tables 1 and 2. Further, the pH thereof was measured according to the method described below.

10 <Method of measuring pH>

The pH was measured at 25°C using a pH meter (HM-30R type, manufactured by DKK-TOA CORPORATION) according to a glass electrode measurement method by diluting a sample with purified water at 20 mass times and stirring the solution so that the content was dissolved therein.

[0064]

 <Evaluation method>

[Non-entanglement of hair-bundle at time of rinsing, smoothness of hair-bundle at time of rinsing, non-stickiness of hair-bundle during drying, and speed of drying time of hair-bundle]

 (Hair-bundle for evaluation)

A hair-bundle having a weight of 20 g, a length of 30 cm, and a width of 5.5 cm was prepared using straight hair of a Japanese using hair colors four times a year. This hair-bundle was wet with running water at 40°C for 30 seconds, coated with 1 g of model shampoo showing the following prescription, and

then foamed. Thereafter, the hair-bundle was rinsed and cleaned with running water at 40°C for 30 seconds while the fingers were passed through the hair-bundle. The hair-bundle after this process was used for evaluation.

5 [0065]

(Composition of model shampoo)

(Component) (% by mass)

Polyoxyethylene (2.0) sodium lauryl ether sulfate

15.5

10 Lauric acid diethanolamide

2.2

Disodium edetate

0.15

Sodium benzoate

0.18

Oxybenzone

0.03

Phosphoric acid

0.07

15 Sodium chloride

0.8

Perfume

0.4

Purified water

residual amount

(total amount)

100

[0066]

20 (Treatment method)

The hair-bundle was drawn through the hand so that an extra moisture was removed until the moisture content of hair-bundle for evaluation became 20 g. Next, the hair-bundle was coated with 1 g of the shampoo composition listed in Tables 1 and 2 and then foamed for 20 seconds. Next, a sensory evaluation was performed from the viewpoints of entanglement and smoothness while rinsing the hair with tap water under

conditions of a temperature of 40°C and a flow rate of 60 mL/s for 20 seconds.

[0067]

(Non-entanglement of hair-bundle at time of rinsing)

5 In regard to the non-entanglement of hair-bundle at the time of rinsing, one item was selected from "does not feel entanglement of hair"/"cannot say"/"feel entanglement of hair".

The evaluation was performed by seven panelists. The numbers of panelists who answered as "does not feel entanglement of hair"/"cannot say"/"feel entanglement of hair" were listed in Tables 1 and 2 in order.

[0068]

(Smoothness of hair-bundle at time of rinsing)

15 In regard to the smoothness of hair-bundle at the time of rinsing, one item was selected from "smooth"/"cannot say"/"does not smooth".

The evaluation was performed by seven panelists. The numbers of panelists who answered as "smooth"/"cannot say"/"does not smooth" were listed in Tables 1 and 2 in order.

20 [0069]

(Speed of drying time of hair-bundle)

After the evaluations of the non-entanglement and the smoothness at the time of rinsing described above, moisture was wiped off with a towel such that the moisture content of hair-bundle became 10 g. The hair-bundle was disposed such that the distance from an outlet of a drier (Solis TYPE315, manufactured by CAN Co., Ltd., setting was high/very hot) to

the center of the hair-bundle in the longitudinal direction was set to approximately 20 cm, and the drier was fixed such that the hair-bundle was hit by hot air from the side. The hair-bundle was dried using a drier while the fingers were passed through the hair-bundle. A time from when the drying was started using the drier to when a researcher determined that the hair-bundle was completely dried was measured and this time was set as the speed of the drying time of hair-bundle.

10 [0070]

(Non-stickiness of hair-bundle during drying)

Sensory evaluation of the stickiness of hair-bundle during drying was performed while the same treatment was performed as in "speed of the drying time of hair-bundle" described above. In the evaluation, one item was selected from "is not sticky during drying"/"cannot say"/"feel stickiness during drying".

The evaluation was performed by seven panelists. The numbers of panelists who answered as "is not sticky during drying"/"cannot say"/"feel stickiness during drying" were listed in Tables 1 and 2 in order.

[0071]

[Settlement of hair-bundle after drying]

(hair-bundle for evaluation)

25 A hair-bundle which was obtained by grafting Chinese non-chemically treated hair with a length of 30 cm and had a density of approximately 200 hairs/cm² in a region with a size

of 6 cm × 6 cm, a hair growing angle of 60°C was prepared. This hair-bundle was wet with running water at 40°C for 30 seconds, coated with 1 g of model shampoo showing the following prescription, and then foamed. Thereafter, the hair-
5 bundle was rinsed with hot water at 40°C for 30 seconds while the fingers were passed through the hair-bundle. The hair-bundle after this process was used for evaluation.

[0072]

(Treatment method)

10 The hair-bundle was sufficiently wet with tap water at 40°C, coated with 1 g of the shampoo composition listed in Tables 1 and 2, foamed for 20 seconds, and rinsed with tap water at 40°C for 20 seconds. Thereafter, moisture was wiped off with a towel such that the moisture content of hair-bundle
15 became 3 g.

Subsequently, the hair-bundle was disposed such that the distance from an outlet of a drier to the center of the hair-bundle in the longitudinal direction was set to approximately 20 cm, and the drier was fixed such that the hair-bundle was
20 hit by hot air from the side. The hair-bundle was dried using a drier by being swung at a length of 10 cm in the horizontal direction and at a speed of two reciprocations per second, a comb (NEW DELRIN COMB, manufactured by DELRIN) was passed from the root to the hair tip once in 30 seconds, and the
25 settlement of the hair-bundle after the hair-bundle was completely dried was evaluated.

The evaluation was performed by seven panelists, and one

item was selected from "hair-bundle does not have raising hair or ruffling hair (flyaway hair) and is settled to the tip of hair"/"cannot say"/"hair-bundle has many raising hairs or ruffling hairs and is poorly settled".

5 The numbers of panelists who answered as "hair-bundle does not have raising hair or ruffling hair and is settled to the tip of hair"/"cannot say"/"hair-bundle has many raising hairs or ruffling hairs and is poorly settled" were listed in Tables 1 and 2 in order.

10 [0073]

[Table 1]

Component (% by mass)	Labeling name	Example										
		1	2	3	4	5	6	7	8	9	10	11
(A)C-HPC	PPG-2 hydroxypropyl trimonium cellulose *1	0.05	0.005	0.01	0.10	0.4	0.75	0.05	0.05	0.05	0.05	0.01
(B) cationized guar gum	guar hydroxypropyl trimonium chloride *2	0.1	0.1	0.1	0.1	0.1	0.1	0.1				0.6
(B) cationized cellulose other than (A)	Polyquaternium-10 *3									0.1		
(B) cationic polymer	Polyquaternium-52 *4										0.1	
(C) sulfate type surfactant	Ammonium laureth (1) sulfate *5	12	12	12	12	12	20	12	12	12	12	12
(D) carboxylate type surfactant	Sodium laureth (4) carboxylate	1	1	1	1	1	1	0.2	3	1	1	1
(E) silicone	Dimethicone mixture *6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6
Hydrochloric acid		(pH6.0)	(pH6.0)	(pH6.0)	(pH6.0)	(pH6.0)	(pH6.0)	(pH6.0)	(pH6.3)	(pH6.0)	(pH6.0)	(pH6.0)
Water		Balance	Balance	Balance	Balance	Balance	Balance	Balance	Balance	Balance	Balance	Balance
Mass ratio	Total	100	100	100	100	100	100	100	100	100	100	100
	(C)/(A)	240	2400	1200	120	30	26.7	240	240	240	240	1200
	(C)/(D)	12	12	12	12	12	20	60	4	12	12	12
	(A)/(B)	0.5	0.05	0.1	1	4	7.5	0.5	0.5	0.5	0.5	0.017
	((C)+(D))/(A)	260	2600	1300	130	32.5	28	244	300	260	260	1300
Evaluation results	Non-entanglement of hair-bundle at time of rinsing	6/1/0	6/1/0	6/1/0	7/0/0	5/2/0	4/3/0	4/3/0	5/2/0	5/2/0	6/1/0	6/1/0
	Smoothness of hair- bundle at time of rinsing	6/1/0	7/0/0	6/1/0	6/1/0	4/3/0	4/3/0	4/3/0	5/2/0	4/3/0	5/2/0	6/1/0
	Non-stickiness of hair-bundle during drying	6/1/0	5/2/0	5/2/0	7/0/0	6/1/0	6/1/0	6/1/0	5/2/0	5/2/0	5/2/0	6/1/0
	Speed (sec) of drying time of hair-bundle	110	120	120	110	105	120	123	127	120	110	115
	Settlement of hair- bundle after drying	7/0/0	5/2/0	6/1/0	7/0/0	7/0/0	6/1/0	4/3/0	5/2/0	6/1/0	4/3/0	6/1/0

[0074]

[Table 2]

Component (% by mass)	Labeling name	Comparative Example					
		1	2	3	4	5	6
(A) C-HPC	PPG-2 hydroxypropyl trimonium cellulose *1		2	0.05	0.05		
(B) cationized guar gum	guar hydroxypropyl trimonium chloride *2	0.1	0.1	0.1	0.1	0.1	
(B) cationized cellulose other than (A)	Polyquaternium-10 *3					0.05	0.4
(B) cationic polymer	Polyquaternium-52 *4						
(C) sulfate type surfactant	Ammonium laureth (1) sulfate *5	12	12	12		12	11.4
(D) carboxylate type surfactant	Sodium laureth (4) carboxylate	1	1		1	1	3.8
(E) silicone	Dimethicone mixture *6	0.6	0.6	0.6	0.6	0.6	0.6
Hydrochloric acid		(pH6.0)	(pH6.0)	(pH6.0)	(pH6.0)	(pH6.0)	(pH6.4)
Water		Balance	Balance	Balance	Balance	Balance	Balance
	Total	100	100	100	100	100	100
Mass ratio	(C)/(A)	-	6	240	0	-	22.8
	(C)/(D)	12	12	-	0	12	3
	(A)/(B)	0	20	0.5	0.5	0	1.25
	((C)+(D))/(A)	-	6.5	240	20	-	30.4
Evaluation results	Non-entanglement of hair-bundle at time of rinsing	0/3/4	0/3/4	0/3/4	0/1/6	0/1/6	2/5/0
	Smoothness of hair-bundle at time of rinsing	0/3/4	0/3/4	0/2/5	0/3/4	0/1/6	2/5/0
	Non-stickiness of hair-bundle during drying	0/3/4	0/1/6	6/1/0	0/3/4	4/3/0	0/0/7
	Speed (sec) of drying time of hair-bundle	135	140	145	130	120	140
	Settlement of hair-bundle after drying	0/1/6	0/3/4	0/4/3	0/1/6	3/4/0	0/4/3

[0075]

In Tables 1 and 2, the following components were used as each component.

*1 PPG-2 hydroxypropyl trimonium cellulose: (average
5 polymerization degree: 800, substitution degree of cationized ethyleneoxy group: 0.2, substitution degree of propyleneoxy group: 2.2, X⁻ in the General Formula (4): chloride ion)

2* guar hydroxypropyl trimonium chloride: JAGUAR C-14SK, manufactured by Solvay SA

10 *3 polyquaternium-10: POISE C-150L, manufactured by Kao Corp.

*4 polyquaternium-52: SOFCARE KG-101E, manufactured by Kao Corp.

15 *5 ammonium laureth (1) sulfate: EMAL 125A, manufactured by Kao Corp.

*6 dimethicone mixture: average polymerization degree of 50 to 300:1000 to 3000 = 42:18

[0076]

As shown from Tables 1 and 2, since the shampoo
20 compositions of respective examples contain the components (A) to (D) at a specific proportions, the shampoo compositions were excellent in a balance of the quick drying property, the non-entanglement and smoothness at the time of rinsing, the non-stickiness during drying, and the effect of the settlement
25 after drying, compared to the comparative examples.

[0077]

(Prescription Example 1)

A prescription example (active amount was shown) of the hair cleansing agent composition is shown below.

	C-HPC *1	0.05% by mass
	Polyquaternium-7 *7	0.1% by mass
5	Sodium ammonium laureth (1) sulfate *5	12.0% by mass
	Sodium laureth (4) carboxylate	1.0% by mas
	Lauramidopropyl betaine *8	1.0% by mass
	Dimethicone mixture *6	1.0% by mas
	Purified water	balance
10	Total amount	100% by mass

[0078]

In the prescription example described above, the following components are used as each component in addition to those described above.

15 *7 polyquaternium-7: MERQUAT 550, manufactured by
Lubrizol Advance Materials

 *8 lauramidopropyl betaine: AMPHITOL 20AB, manufactured
by Kao Corp.

[0079]

20 (Prescription Example 2)

A prescription example (active amount was shown) of the hair cleansing agent composition is shown below.

	C-HPC *1	0.05% by mass
	Guar hydroxypropyl trimonium chloride *2	
25		0.3% by mass
	Polyquaternium-10 *3	0.1% by mass
	Polyquaternium-52 *4	0.1% by mass

	Sodium ammonium laureth (1) sulfate *5	12.0% by mass
	Sodium laureth (4) carboxylate	1.0% by mas
	Dimethicone mixture *6	1.0% by mas
	Purified water	balance
5	Total amount	100% by mass

It is apparent that the present invention is not limited to the above embodiment, and may be modified and changed without departing from the scope and spirit of the present invention.

CLAIMS

1. A hair cleansing agent composition comprising:

a component (A) that is a cationized hydroxy propyl
 5 cellulose which has a main chain derived from anhydroglucose
 represented by a following General Formula (1), has a
 substitution degree by a cationized ethyleneoxy group of equal
 to or greater than 0.01 and equal to or less than 2.9, and has
 a substitution degree by a propyleneoxy group of equal to or
 10 greater than 0.1 and equal to or less than 4.0;

a component (B) that is a cationic polymer other than the
 component (A);

a component (C) that is a sulfate type surfactant;

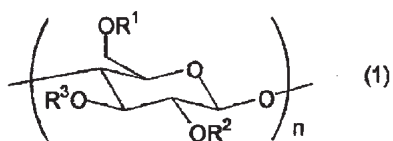
a component (D) that is a carboxylate type surfactant;

15 and

water,

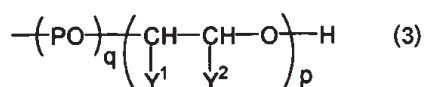
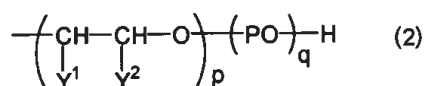
wherein a mass ratio ((C)/(A)) of the content of the
 component (C) to the content of the component (A) is equal to
 or greater than 26 and equal to or less than 20000, and

20 a mass ratio ((C)/(D)) of the content of the component
 (C) to the content of the component (D) is equal to or greater
 than 4 and equal to or less than 200,



(in the General Formula (1), R¹, R², and R³ each
 25 independently represent a substituent represented by a

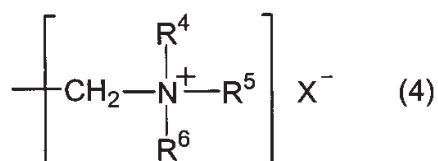
following General Formula (2) or (3) and n represents an average polymerization degree of the anhydroglucose, which is a number equal to or greater than 50 and equal to or less than 5000),



5

(in the General Formulae (2) and (3), one of Y^1 and Y^2 represents a hydrogen atom and the other represents a cationic group represented by a following General Formula (4), PO represents a propyleneoxy group, p represents a number of cationized ethyleneoxy groups $(-\text{CH}(\text{Y}^1) - \text{CH}(\text{Y}^2) - \text{O}-)$, q represents a number of propyleneoxy groups $(-\text{PO}-)$, p and q each independently represent 0 or a positive integer, where all p's and q's in R^1 , R^2 , and R^3 do not represent 0 at the same time, and in a case where both of p and q do not represent 0, the order of adding the cationized ethyleneoxy group and the propyleneoxy group is not limited, and in a case where both of p and q do not represent 0 and one or both of p and q represent an integer of 2 or greater, a block bond or a random bond may be provided), and

15



20

(in the General Formula (4), R^4 , R^5 , and R^6 each independently represent a linear or branched alkyl group

having equal to or more than 1 and equal to or less than 3 carbon atoms, and X^- represents an anionic group).

2. The hair cleansing agent composition according to claim 1,
5 wherein the content of the component (A) in the hair
cleansing agent composition is equal to or greater than 0.001%
by mass and equal to or less than 1.5% by mass with respect to
the total content of the hair cleansing agent composition.

10 3. The hair cleansing agent composition according to claim 1
or 2,

 wherein the content of the component (B) in the hair
cleansing agent composition is equal to or greater than 0.01%
by mass and equal to or less than 3% by mass with respect to
15 the total content of the hair cleansing agent composition.

4. The hair cleansing agent composition according to any one
of claims 1 to 3,

 wherein the content of the component (C) in the hair
20 cleansing agent composition is equal to or greater than 3% by
mass and equal to or less than 20% by mass with respect to the
total content of the hair cleansing agent composition.

5. The hair cleansing agent composition according to any one
25 of claims 1 to 4,

 wherein the content of the component (D) in the hair
cleansing agent composition is equal to or greater than 0.1%

by mass and equal to or less than 10% by mass with respect to the total content of the hair cleansing agent composition.

6. The hair cleansing agent composition according to any one
5 of claims 1 to 5,

wherein the mass ratio $((A)/(B))$ of the content of the component (A) to the content of the component (B) in the hair cleansing agent composition is equal to or greater than 0.001 and equal to or less than 150.

10

7. The hair cleansing agent composition according to claim 6,
wherein the mass ratio $((A)/(B))$ is equal to or greater than 0.2 and equal to or less than 3.

15 8. The hair cleansing agent composition according to any one of claims 1 to 7,

wherein the mass ratio $((C)/(A))$ is equal to or greater than 100 and equal to or less than 500.

20 9. The hair cleansing agent composition according to any one of claims 1 to 8,

wherein the component (B) is at least one selected from the group consisting of cationized galactomannan, cationized hydroxyethyl cellulose (polyquaternium-10), cationized starch,
25 polyquaternium-6, polyquaternium-7, polyquaternium-22, and polyquaternium-52.

10. The hair cleansing agent composition according to any one of claims 1 to 9, further comprising:

a silicone as a component (E).

5 11. A method of washing a hair comprising:

applying the hair cleansing agent composition according to any one of claims 1 to 10 to the hair; and
rinsing the hair with water.