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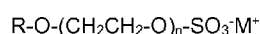
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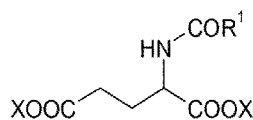
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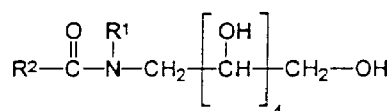
(54) Title: PERSONAL CLEANSING COMPOSITION



(I)



(II)



(III)

(57) **Abstract**: The invention provides a personal cleansing composition comprising, in an aqueous continuous phase: (i) from 3 to 10% (by weight based on the total weight of the composition) of a first anionic surfactant which is preferably selected from alkyl ether sulfates of general formula (I): $\text{R-O}-(\text{CH}_2\text{CH}_2\text{-O})_n\text{-SO}_3^-\text{M}^+$ (I) in which R is a straight or branched chain alkyl group having 10 to 14 carbon atoms, n is a number that represents the degree of ethoxylation and ranges from 2 to 5, and M is a solubilising cation selected from alkali metal, ammonium, substituted ammonium or organic amine cations; (ii) from 2 to 8% (by weight based on the total weight of the composition) of a second anionic surfactant which is different to the first anionic surfactant and which is selected from acyl glutamates of general formula (II): (II) in which COR^1 is a linear or branched acyl group having 6 to 22 carbon atoms and 0,1,2 or 3 double bonds, and each X is independently hydrogen or a solubilising cation selected from alkali metal, ammonium, substituted ammonium or organic amine cations; and (iii) from 1 to 6% (by weight based on the total weight of the composition) of a nonionic surfactant selected from polyhydroxy fatty acid amides of general formula (III): (III) in which R^2CO is a linear or branched acyl group having 6 to 22 carbon atoms and 0,1,2 or 3 double bonds; and R^1 is selected from C_{1-4} alkyl groups and hydroxy-substituted C_{1-4} alkyl groups.

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- *as to applicant's entitlement to apply for and be granted a patent (Rule 4.17(ii))*
- *as to the applicant's entitlement to claim the priority of the earlier application (Rule 4.17(iii))*
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PERSONAL CLEANSING COMPOSITIONField of the Invention

The present invention relates to personal cleansing compositions such as liquid soaps,
5 body washes and shampoos.

Background and Prior Art

Personal cleansing compositions such as liquid soaps, body washes and shampoos are
invariably based on surfactants. Anionic surfactants such as sodium lauryl ether sulfate
10 exhibit superior cleansing and foaming properties, and the established combination of
sodium lauryl ether sulfate with cocamidopropylbetaine is still the most commonly used in
such compositions.

Some consumers, particularly those with dry and/or damaged hair, desire milder
15 compositions. One approach for providing mildness is to replace some of the sodium
lauryl ether sulfate with co-surfactants.

Acyl glutamates have been identified as a class of co-surfactant which are particularly
suitable for the production of shampoos for dry and/or damaged hair because of their
20 mild, gentle cleansing action and affinity for keratin. Acyl glutamates have also been
claimed to improve the dermatological characteristics of surfactant formulations
containing sodium lauryl ether sulfate.

Although acyl glutamates are desirable co-surfactants in personal cleansing compositions
25 for the reasons described above, they can be difficult to solubilize under some
circumstances, leading to stringy or lumpy compositions. This is especially the case at
low temperatures (e.g. 15°C or below). This represents a problem for the formulator,
since such compositions are potentially unusable in countries where low temperatures
prevail for all or part of the year.

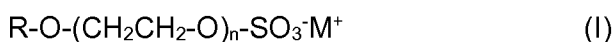
30 The present invention addresses this problem.

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Summary of the Invention

The present invention provides a personal cleansing composition comprising, in an aqueous continuous phase:

- 5 (i) from 3 to 10% (by weight based on the total weight of the composition) of a first anionic surfactant which is preferably selected from alkyl ether sulfates of general formula (I):

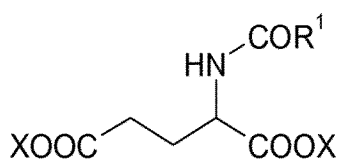


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in which R is a straight or branched chain alkyl group having 10 to 14 carbon atoms, n is a number that represents the degree of ethoxylation and ranges from 2 to 5, and M is a solubilising cation selected from alkali metal, ammonium, substituted ammonium or organic amine cations;

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- (ii) from 2 to 8% (by weight based on the total weight of the composition) of a second anionic surfactant which is different to the first anionic surfactant and which is selected from acyl glutamates of general formula (II):



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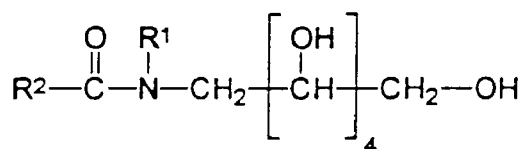
(II)

in which COR¹ is a linear or branched acyl group having 6 to 22 carbon atoms and 0,1,2 or 3 double bonds, and each X is independently hydrogen or a solubilising cation selected from alkali metal, ammonium, substituted ammonium or organic amine cations; and

25

- (iii) from 1 to 6% (by weight based on the total weight of the composition) of a nonionic surfactant selected from polyhydroxy fatty acid amides of general formula (III):

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(III)

in which R^2CO is a linear or branched acyl group having 6 to 22 carbon atoms and 0,1,2 or 3 double bonds; and R^1 is selected from C_{1-4} alkyl groups and hydroxy-substituted C_{1-4} alkyl groups.

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Detailed Description of the Invention

All molecular weights as used herein are weight average molecular weights, unless otherwise specified.

10 By "aqueous continuous phase" is meant a continuous phase which has water as its basis.

Suitably, the composition of the invention will comprise from about 50 to about 90%, preferably from about 55 to about 85%, more preferably from about 60 to about 85%,
 15 most preferably from about 65 to about 83% water (by weight based on the total weight of the composition).

The composition of the invention comprises a first anionic surfactant which is preferably selected from alkyl ether sulfates of general formula (I) as defined above.

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In general formula (I), M is preferably sodium, potassium, ammonium or an alkanolamine (such as triethanolamine), R is preferably a C_{10} or C_{12} linear alkyl group and the average degree of ethoxylation n preferably ranges from 2 to 4, more preferably from 2 to 3.5, most preferably from 2 to 3 and ideally from 2.2 to 3.

25

An example of a preferred alkyl ether sulfate having general formula (I) for use in the invention is SLES 3EO (i.e. sodium lauryl ether sulfate in which the average degree of ethoxylation n is 3).

30 Commercially produced alkyl ether sulfates generally contain a mixture of homologues and the degree of ethoxylation is a statistical average value which may be an integer or a

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fraction. The value of n in general formula (I) is governed by the starting molar ratio of ethylene oxide to aliphatic alcohol in the ethoxylation reaction and the temperature, time and catalytic conditions under which the ethoxylation reaction takes place.

- 5 A commercially produced alkyl ether sulfate having general formula (I) will usually comprise a mixture of homologues in which from 55 to 80 mol% of the total mixture is made up of homologues with ethoxy chains of 5EO or less (down to 0EO, i.e. unethoxylated alkyl sulfate), with the remainder of the mixture made up of homologues with ethoxy chains of 6EO or more (up to about 10EO). Higher homologues (e.g. up to
- 10 about 15EO) may also be present on small amounts (typically no more than 1 to 2 mol% of the total mixture per individual homologue). A typical breakdown in molar percentage terms for commercially produced alkyl ether sulfates having general formula (I) is given in the following Table:

x	% m/m of R-O-(CH₂CH₂-O)_x-SO₃-M⁺
0	10 to 15
1	7 to 11
2	10 to 12
3	10 to 15
4	10 to 12
5	9 to 11
6	6 to 10
7	5 to 9
8	3 to 7
9	3 to 5
10	2 to 4
11	0 to 2
12	0 to 2
13	0 to 1
14	0 to 1
15	0 to 0.5

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Examples of commercially produced alkyl ether sulfates having general formula (I) and suitable for use in the invention include STEOL® CS-330 HA (ex Stepan Company) and Texapon® N 70 LS (ex BASF).

5 Mixtures of any of the above described materials may also be used.

In a typical composition according to the invention the level of first anionic surfactant (preferably alkyl ether sulfate of general formula (I)) will generally range from 3 to 12%, and preferably ranges from 4 to 10% by weight based on the total weight of the
10 composition.

In a preferred composition according to the invention the first anionic surfactant is SLES 3EO (i.e. sodium lauryl ether sulfate in which the average degree of ethoxylation n is 3), in an amount ranging from 4 to 10% by weight based on the total weight of the
15 composition.

The composition of the invention comprises a second anionic surfactant which is different to the first anionic surfactant and which is selected from acyl glutamates of general formula (II) as defined above.
20

Preferably, COR¹ in general formula (II) is selected from linear acyl groups having from 8 to 18 carbon atoms and 0, 1, 2 or 3 double bonds and mixtures thereof.

Preferably X in general formula (II) is sodium, potassium, ammonium or an alkanolamine (such as triethanolamine).
25

More preferably, COR¹ in general formula (II) is selected from lauroyl, myristoyl, palmitoyl, stearoyl, oleoyl and cocoyl groups and mixtures thereof.

30 Most preferably COR¹ in general formula (II) is a cocoyl group. The term "cocoyl" denotes a mixture of acyl groups having a distribution of carbon chain lengths corresponding to that found in coconut fatty acids. Generally, in such a mixture at least about 85% (by weight based on total weight) of the carbon chains are C₈ to C₁₈; and at least about 50% (by weight based on total weight) of the carbon chains are C₈ to C₁₂.

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In a typical cocoyl group, the carbon chain length distribution is generally defined as follows:

	C ₈	5 to 10 wt. %
5	C ₁₀	5 to 10 wt. %
	C ₁₂	48 to 56 wt. %
	C ₁₄	15 to 23 wt. %
	C ₁₆	7 to 12 wt. %
	C ₁₈	1 to 5 wt. %
10	C _{18:1}	4 to 12 wt. %
	C _{18:2}	1 to 4 wt. %

Examples of commercially produced acyl glutamates having general formula (II) and suitable for use in the invention include sodium cocoyl glutamate (AMISOFT® CS-11 ex
 15 Ajinomoto Co. Inc.), disodium cocoyl glutamate (AMISOFT® ECS-22SB ex Ajinomoto Co. Inc.), triethanolammonium cocoyl glutamate (AMISOFT® CT-12 ex Ajinomoto Co. Inc.) triethanolammonium lauroyl glutamate (AMISOFT® LT-12 ex Ajinomoto Co. Inc.), sodium myristoyl glutamate (AMISOFT® MS-11 ex Ajinomoto Co. Inc.) ,sodium stearoyl glutamate (AMISOFT® HS-11 P ex Ajinomoto Co. Inc.) and mixtures thereof.

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Preferred acyl glutamates of general formula (II) for use in the invention include sodium cocoyl glutamate, disodium cocoyl glutamate and mixtures thereof.

Mixtures of any of the above described materials may also be used.

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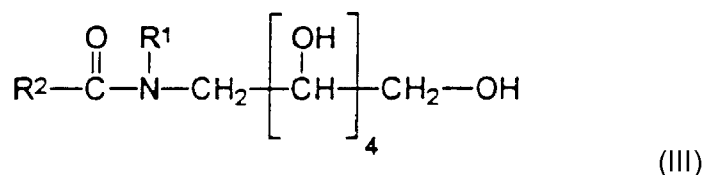
In a typical composition according to the invention the level of acyl glutamate of general formula (II) will generally range from 1 to 10%, and preferably ranges from 2 to 8% by weight based on the total weight of the composition.

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In a preferred composition according to the invention the acyl glutamate of general formula (II) is selected from sodium cocoyl glutamate, disodium cocoyl glutamate and mixtures thereof, in an amount ranging from 2 to 8% by weight based on the total weight of the composition.

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The composition of the invention comprises a nonionic surfactant selected from polyhydroxy fatty acid amides of general formula (III) as defined above.



- 5 in which R^2CO is a linear or branched acyl group having 6 to 22 carbon atoms and 0,1,2 or 3 double bonds; and R^1 is selected from C_{1-4} alkyl groups and hydroxy-substituted C_{1-4} alkyl groups.

- 10 Preferably, R^2CO in general formula (III) is selected from linear acyl groups having from 8 to 18 carbon atoms and 0, 1, 2 or 3 double bonds and mixtures thereof.

More preferably, R^2CO in general formula (III) is selected from lauroyl, myristoyl, and cocoyl groups and mixtures thereof.

- 15 Preferably R^1 in general formula (III) is methyl.

- Examples of commercially produced polyhydroxy fatty acid amides having general formula (III) and suitable for use in the invention include capryloyl/caproyl methyl glucamide (GlucoTain® Clear, ex Clariant Ltd.), lauroyl/myristoyl methyl glucamide
20 (GlucoTain® Flex, ex Clariant Ltd.), cocoyl methyl glucamide (GlucoTain® Care, ex Clariant Ltd.), and mixtures thereof.

- Preferred polyhydroxy fatty acid amides of general formula (III) for use in the invention include lauroyl methyl glucamide, myristoyl methyl glucamide, cocoyl methyl glucamide
25 and mixtures thereof.

Mixtures of any of the above described materials may also be used.

- In a typical composition according to the invention the level of polyhydroxy fatty acid amide of general formula (III) will preferably range from 3 to 5% by weight based on the
30 total weight of the composition.

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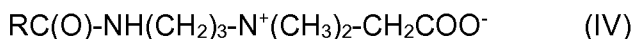
In a preferred composition according to the invention the polyhydroxy fatty acid amide of general formula (III) is selected from lauroyl methyl glucamide, myristoyl methyl glucamide, cocoyl methyl glucamide and mixtures thereof, in an amount ranging from 3 to 5% by weight based on the total weight of the composition.

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Surprisingly, the inventors have found that alkylamidoalkyl betaines do not provide satisfactory performance in the context of this invention. Accordingly, it is preferred that such materials are absent from the composition of the invention, or included in minor quantities only, such less than 0.1%, and more preferably less than 0.01% by weight based on the total weight of the composition.

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The term "alkylamidoalkyl betaine" in the context of this invention denotes materials having the general formula (IV):



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in which RC(O) is selected from linear acyl groups having from C₈ to C₁₈ carbon atoms and 0, 1, 2 or 3 double bonds and mixtures thereof. An example of such a material is cocoamidopropyl betaine, in which RC(O) in general formula (IV) is a cocoyl group (as is further described above).

20

In a typical composition according to the invention, the weight ratio of first anionic surfactant (preferably alkyl ether sulfate of general formula (I)) to acyl glutamate of general formula (II) generally ranges from 2.5:1 to 1:1, and preferably ranges from 1.5:1 to 1:1.

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In a typical composition according to the invention, the weight ratio of acyl glutamate of general formula (II) to polyhydroxy fatty acid amide of general formula (III) generally ranges from 2.5:1 to 1:1, and preferably ranges from 1.5:1 to 1:1.

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The composition of the invention preferably comprises one or more dispersed benefit agents selected from hydrophobic emulsion droplets and particulate solids.

The term "benefit agent" in the context of this invention includes materials which can provide a benefit to the hair and/or the scalp and/or the skin (preferably the hair and/or

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the scalp) as well as those materials which are beneficially incorporated into personal cleansing compositions, such as aesthetic agents.

Hydrophobic emulsion droplets for inclusion in the composition of the invention typically
5 have a mean droplet diameter ($D_{3,2}$) of 4 micrometres or less. Preferably the mean droplet diameter ($D_{3,2}$) is 1 micrometre or less, more preferably 0.5 micrometre or less, and most preferably 0.25 micrometre or less.

A suitable method for measuring the mean droplet diameter ($D_{3,2}$) is by laser light
10 scattering using an instrument such as a Malvern Mastersizer.
Preferred hydrophobic emulsion droplets in this context include emulsion droplets of hair and/or skin conditioning ingredients such as silicones and hydrocarbon oils.

Suitable silicones for use in the invention include polydiorganosiloxanes, in particular
15 polydimethylsiloxanes (dimethicones), polydimethyl siloxanes having hydroxyl end groups (dimethiconols), and amino-functional polydimethylsiloxanes (amodimethicones).

Such silicones are preferably non-volatile (with vapour pressure of less than 1000 Pa at 25°C), and preferably have a molecular weight of greater than 100,000, more preferably
20 greater than 250,000.

Such silicones preferably have a kinematic viscosity of greater than 50,000 cS ($\text{mm}^2.\text{s}^{-1}$) and more preferably a kinematic viscosity of greater than 500,000 cS ($\text{mm}^2.\text{s}^{-1}$). Silicone kinematic viscosities in the context of this invention are measured at 25°C and can be
25 measured by means of a glass capillary viscometer as set out further in Dow Corning Corporate Test Method CTM004 July 20, 1970.

Suitable silicones for use in the invention are available as pre-formed silicone emulsions from suppliers such as Dow Corning and GE Silicones. The use of such pre-formed
30 silicone emulsions is preferred for ease of processing and control of silicone particle size. Such pre-formed silicone emulsions will typically additionally comprise a suitable emulsifier, and may be prepared by a chemical emulsification process such as emulsion polymerisation, or by mechanical emulsification using a high shear mixer. Pre-formed

- 10 -

silicone emulsions having a mean droplet diameter ($D_{3,2}$) of less than 0.15 micrometers are generally termed microemulsions.

5 Examples of suitable pre-formed silicone emulsions include emulsions DC2-1766, DC2-1784, DC-1785, DC-1786, DC-1788, DC-1310, DC-7123 and microemulsions DC2-1865 and DC2-1870, all available from Dow Corning. These are all emulsions/microemulsions of dimethiconol. Also suitable are amodimethicone emulsions such as DC939 (from Dow Corning) and SME253 (from GE Silicones).

10 Mixtures of any of the above described silicone emulsions may also be used.

Suitable hydrocarbon oils for use in the invention include saturated, non-polar straight or branched- chain aliphatic or alicyclic hydrocarbons having from about 10 to about 50 carbon atoms, and mixtures thereof.

15

Such hydrocarbon oils preferably have a kinematic viscosity of 1 to 35 cS ($\text{mm}^2 \cdot \text{s}^{-1}$) at 40°C and a specific gravity of 0.76 to 0.87 at 25°C.

A preferred hydrocarbon oil in the context of the present invention is light mineral oil.

20

Mineral oils are clear oily liquids obtained from petroleum oil, from which waxes have been removed, and the more volatile fractions removed by distillation. The fraction distilling between 250°C to 300°C is termed mineral oil, and it consists of a mixture of hydrocarbons, in which the number of carbon atoms per hydrocarbon molecule generally ranges from C_{10} to C_{40} .

25

The mineral oil may be characterised in terms of its viscosity, where light mineral oil is less viscous than heavy mineral oil. A suitable light mineral oil will generally have a kinematic viscosity of 3.9 to 5.0 cS ($\text{mm}^2 \cdot \text{s}^{-1}$) at 40°C and a specific gravity of 0.810 to 0.830 at 25°C. Such materials are commercially available under the brand name Lytol®.

30

Suitable particulate solids for inclusion in the composition of the invention include solid antimicrobial actives (such as zinc pyridinethione, climbazole, sulphur, piroctone olamine, octopirox, selenium disulphide and ketoconazole), solid colorants (such as hair dyes and

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pigments), and flaky or platelet pearlescers or opacifiers (such as magnesium aluminium silicate, zinc oxide, titanium dioxide and coated mica).

Mixtures of any of the above described materials may also be used.

5

In a typical composition according to the invention the level of dispersed benefit agent (as defined above) depends on the particular material(s) used, but generally ranges from 0.01 to 20%, preferably from 0.02 to 10% by weight based on the total weight of the composition. In preferred compositions according to the invention, the one or more

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dispersed benefit agents includes one or more silicone emulsions (as further described above) and the level of silicone (*per se* as active ingredient) ranges from 0.01 to 10%, preferably from 0.5 to 5% by weight based on the total weight of the composition.

The composition of the invention preferably includes one or more cationic polymers.

Such polymers may enhance the delivery of conditioning agents and thereby improve the

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Cationic polymers typically contain cationic nitrogen-containing groups such as quaternary ammonium or protonated amino groups. The protonated amino groups can be primary, secondary, or tertiary amines (preferably secondary or tertiary). The cationic

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nitrogen-containing group of the cationic polymer is generally present as a substituent on all, or more typically on some, of the repeat units making up the polymer.

Preferably the cationic nitrogen-containing groups are selected from quaternary ammonium groups bearing three radicals, which may be identical or different, chosen

25

from hydrogen and alkyl radicals containing 1 to 10, more preferably 1 to 6 and most preferably 1 to 3 carbon atoms.

Any anionic counterion can be used in association with the cationic polymer so long as the counterion is physically and chemically compatible with the essential components of

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the composition or does not otherwise unduly impair product performance, stability or aesthetics. Examples of such counterions include halides (e.g., chloride, fluoride, bromide, iodide), sulfate and methylsulfate.

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The weight average molecular weight (M_w) of the cationic polymer is preferably from about 5,000 to about 10 million, more preferably from about 100,000 to about 1 million g/mol.

- 5 The cationic polymer generally has a cationic charge density ranging from about 0.2 to about 7 meq/gm. The term "cationic charge density" in the context of this invention refers to the ratio of the number of positive charges on a monomeric unit of which a polymer is comprised to the molecular weight of the monomeric unit. The charge density multiplied by the polymer molecular weight determines the number of positively charged sites on a
- 10 given polymer chain. Cationic charge density can be determined according to the Kjeldahl Method. Those skilled in the art will recognize that the charge density of amino-containing polymers may vary depending upon pH and the isoelectric point of the amino groups. The charge density should be within the above limits at the pH of intended use. Cationic polymers for use in the invention preferably have a cationic charge density ranging from
- 15 about 0.3 to about 4 meq/g, more preferably from about 0.4 to about 3.5 meq/g.

Suitable cationic polymers for use in the invention include cationic polysaccharide derivatives, such as cationic cellulose derivatives, cationic starch derivatives, and cationic

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Preferred cationic polysaccharide derivatives for use in the invention include cationic guar gum derivatives and cationic cellulose derivatives.

Examples of preferred cationic guar gum derivatives for use in the invention include guar hydroxypropyltrimethylammonium chlorides such as JAGUAR® C13S, JAGUAR® C14, JAGUAR® C15 and JAGUAR® C17.

Examples of preferred cationic cellulose derivatives for use in the invention include poly(1,2-oxyethanediyl)-2-hydroxy-3-trimethylammonium propyl chloride cellulose ethers (INCI: Polyquaternium-10) such as UCARE® Polymer JR-125, UCARE® Polymer JR-400, UCARE® Polymer JR-30M, UCARE® Polymer LR-400 and UCARE® Polymer LR-30M.

Mixtures of any of the above described cationic polymers may also be used.

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When included, the total level of cationic polymer in the composition is preferably from 0.01 to 2% and more preferably from 0.05 to 1% by weight based on the total weight of the composition.

- 5 The composition of the invention preferably includes one or more structurants to assist in the suspension of dispersed benefit agent and provide phase stability. Suitable structurants include polyacrylic acids, cross-linked polymers of acrylic acid, copolymers of acrylic acid with a hydrophobic monomer, copolymers of carboxylic acid-containing monomers and acrylic esters, cross-linked copolymers of acrylic acid and acrylate esters, 10 heteropolysaccharide gums and crystalline long chain acyl derivatives.

Mixtures of any of the above structurants may be used.

- When included, the total level of structurant is generally 0.05 to 5%, preferably from 0.1 to 4%, more preferably from 0.2 to 2% by weight based on the total weight of the 15 composition.

The composition of the invention may suitably include at least one inorganic electrolyte. The inorganic electrolyte may be used to help provide viscosity to the composition.

- 20 The viscosity of the composition suitably ranges from 6,000 to 10,000 mPa.s, preferably from 7,000 to 9,000 mPa.s, more preferably from 7,500 to 8,500 mPa.s when measured using a Brookfield V2 viscometer (spindle RTV5, 1 minute, 20rpm) at 30°C.

- Suitable inorganic electrolytes include metal chlorides (such as sodium chloride, 25 potassium chloride, calcium chloride, magnesium chloride, zinc chloride, ferric chloride and aluminium chloride) and metal sulfates (such as sodium sulfate and magnesium sulfate).

- Examples of preferred inorganic electrolytes for use in the invention include sodium 30 chloride, potassium chloride, magnesium sulfate and mixtures thereof.

Mixtures of any of the above described materials may also be suitable.

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The level of inorganic electrolyte in compositions of the invention generally ranges from about 1 to about 25%, preferably from about 2 to about 20%, more preferably from about 3 to about 15% (by total weight inorganic electrolyte based on the total weight of the composition).

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A composition of the invention may contain further optional ingredients to enhance performance and/or consumer acceptability. Examples of such ingredients include fragrance, dyes and pigments, pH adjusting agents and preservatives or antimicrobials. Each of these ingredients will be present in an amount effective to accomplish its

10 purpose. Generally, these optional ingredients are included individually at a level of up to 5% by weight based on the total weight of the composition.

A mildly acidic pH is often desirable in shampoos for reasons such as reduced hair fibre swelling, improved hair lustre, better compatibility with acidic skin or hair care actives in the formulation and optimized efficacy of certain organic preservative systems. The pH of
15 the composition of the invention preferably ranges from 3 to 6, more preferably from 4 to 5.5 and most preferably from 4.5 to 5.1.

The composition of the invention is primarily intended for topical application to the body, preferably the hair and scalp.

20

Most preferably the composition of the invention is topically applied to the hair and then massaged into the hair and scalp. The composition is then rinsed off the hair and scalp with water prior to drying the hair.

25 The invention will be further illustrated by the following, non-limiting Examples, in which all percentages quoted are by weight based on total weight unless otherwise stated.

EXAMPLES

30 A range of model shampoo formulations were prepared, having ingredients as shown in Table 1. Examples 1 and 2 represent formulations according to the invention. Examples A and B represent comparative examples (not according to the invention).

- 15 -

Table 1

Ingredient	Example A (%w/w)	Example B (%w/w)	Example 1 (%w/w)	Example 2 (%w/w)
Sodium laureth sulphate (3EO)	5	5	5	5
Sodium cocoyl glutamate	5	5	5	5
Cocamidopropyl betaine	5	-	-	-
Lauramidopropyl betaine	-	5	-	-
Cocoyl methyl glucamide	-	-	5	-
Lauroyl/myristoyl methyl glucamide	-	-	-	5
Water, minors	to 100%	to 100%	to 100%	to 100%

The formulations were stored in a 5°C fridge and their transparency monitored over time.

- 5 Each formulation was also evaluated for extensional viscosity using an extensional rheometer (HAAKE™ CaBER™ 1 Capillary Breakup Extensional Rheometer). After placing a sample between two plates, the upper plate moves upwards at very high speed and produces a fluid filament. A laser micrometer is used to determine the decrease in filament diameter as a function of time.

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The phase behaviour of each formulation was also determined by microscopy studies on bulk and dried samples.

The results are shown in Table 2 below.

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Table 2

Example	Phase Behaviour
A	Formulation is not isotropic and phase separates on storage Nematic phase seen in bulk and dried sample Extensional viscosity is observed at room temperature, producing an unacceptable lumpy or stringy texture due to the persistence of fluid filaments
B	Formulation is not isotropic and phase separates on storage Crystals of sodium cocoyl glutamate seen in bulk and dried sample
1	Formulation is isotropic No extensional viscosity observed even at low temperature and prolonged storage Dried sample is lamellar
2	Formulation is isotropic No extensional viscosity observed even at low temperature and prolonged storage Dried sample is lamellar

The results show that Examples 1 and 2 (according to the invention) provide consumer-
5 acceptable rheology whereas Examples A and B (comparative examples) do not.

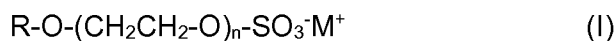
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CLAIMS

1. A personal cleansing composition comprising, in an aqueous continuous phase:

5 (i) from 3 to 10% (by weight based on the total weight of the composition) of a first anionic surfactant which is preferably selected from alkyl ether sulfates of general formula (I):

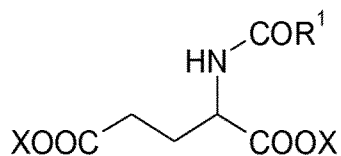


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in which R is a straight or branched chain alkyl group having 10 to 14 carbon atoms, n is a number that represents the degree of ethoxylation and ranges from 2 to 5, and M is a solubilising cation selected from alkali metal, ammonium, substituted ammonium or organic amine cations;

15

(ii) from 2 to 8% (by weight based on the total weight of the composition) of a second anionic surfactant which is different to the first anionic surfactant and which is selected from acyl glutamates of general formula (II):



20

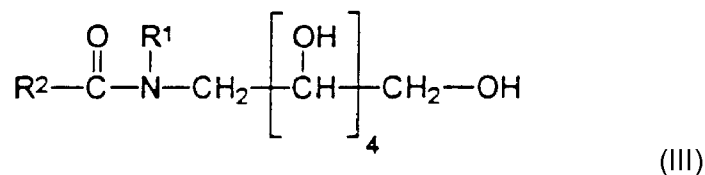
(II)

in which COR¹ is a linear or branched acyl group having 6 to 22 carbon atoms and 0,1,2 or 3 double bonds, and each X is independently hydrogen or a solubilising cation selected from alkali metal, ammonium, substituted ammonium or organic amine cations; and

25

30 (iii) from 1 to 6% (by weight based on the total weight of the composition) of a nonionic surfactant selected from polyhydroxy fatty acid amides of general formula (III):

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in which R^2CO is a linear or branched acyl group having 6 to 22 carbon atoms and 0,1,2 or 3 double bonds; and R^1 is selected from C_{1-4} alkyl groups and hydroxy-substituted C_{1-4} alkyl groups.

2. A composition according to claim 1, in which first anionic surfactant is SLES 3EO (i.e. sodium lauryl ether sulfate in which the average degree of ethoxylation n is 3), in an amount ranging from 4 to 10% by weight based on the total weight of the composition.
3. A composition according to claim 1 or claim 2, in which the acyl glutamate of general formula (II) is selected from sodium cocoyl glutamate, disodium cocoyl glutamate and mixtures thereof, in an amount ranging from 2 to 8% by weight based on the total weight of the composition.
4. A composition according to any preceding claim, in which the polyhydroxy fatty acid amide of general formula (III) is selected from lauroyl methyl glucamide, myristoyl methyl glucamide, cocoyl methyl glucamide and mixtures thereof, in an amount ranging from 3 to 5% by weight based on the total weight of the composition.
5. A method of cleansing and conditioning hair, comprising the following sequential steps:
 - (i) topically applying a composition according to any one of claims 1 to 4 to the hair;
 - (ii) massaging the composition into the hair and scalp;
 - (iii) rinsing the composition off the hair and scalp with water, and
 - (iv) drying the hair.

INTERNATIONAL SEARCH REPORT

International application No
PCT/EP2017/064419

A. CLASSIFICATION OF SUBJECT MATTER
INV. A61K8/42 A61K8/46 A61Q5/12
ADD.

According to International Patent Classification (IPC) or to both national classification and IPC

B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)
A61K A61Q

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

Electronic data base consulted during the international search (name of data base and, where practicable, search terms used)

EPO-Internal

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
Y	US 2014/215727 A1 (OLSSON KRISTIN [DE] ET AL) 7 August 2014 (2014-08-07) whole document, in particular the examples -----	1-5
Y	US 5 009 814 A (KELKENBERG HEIKE [DE] ET AL) 23 April 1991 (1991-04-23) claim 1 -----	1-5
Y	US 2016/143828 A1 (KLUG PETER [DE] ET AL) 26 May 2016 (2016-05-26) claim 1 -----	1-5



Further documents are listed in the continuation of Box C.



See patent family annex.

* Special categories of cited documents :

"A" document defining the general state of the art which is not considered to be of particular relevance

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"O" document referring to an oral disclosure, use, exhibition or other means

"P" document published prior to the international filing date but later than the priority date claimed

"T" later document published after the international filing date or priority date and not in conflict with the application but cited to understand the principle or theory underlying the invention

"X" document of particular relevance; the claimed invention cannot be considered novel or cannot be considered to involve an inventive step when the document is taken alone

"Y" document of particular relevance; the claimed invention cannot be considered to involve an inventive step when the document is combined with one or more other such documents, such combination being obvious to a person skilled in the art

"&" document member of the same patent family

Date of the actual completion of the international search

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INTERNATIONAL SEARCH REPORT

Information on patent family members

International application No

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