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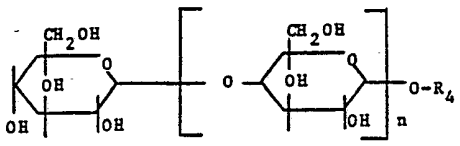
(54) Washing and foaming composition based on non-ionic surface-active agents and anionic polymers

(57) A washing and foaming composition containing at least one non-ionic surface-active agent which, in 10% aqueous solution, has a detergency which is greater than or equal to that of a 2% aqueous solution of sodium lauryl-sulphate, together with at least one anionic polymer in proportions such that the ratio of anionic polymer/non-ionic surface-active agent is greater than 0.1:1, in the absence of any cationic polymer.

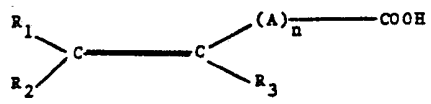
ERRATA

SPECIFICATION NO 2139243A

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Page 11, lines 42 & 43, *delete* Take in illustration 7 *insert*



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SPECIFICATION

Washing and foaming composition based on non-ionic surface-active agents and anionic polymers

The present invention relates to washing and foaming compositions containing non-ionic surface-active agents and anionic polymers, these compositions being intended for treating keratin fibres, and in particular human hair, and the skin.

For many years, non-ionic surface-active agents have been known which, because of their detergency property, are commonly used in shampoo compositions.

Polymers have also already been used in the shampoos for the purpose of modifying the properties of the fibres, especially as regards the hold and the ease of combing of the hair.

We have discovered that it is possible considerably to improve the detergency of non-ionic surface-active agents and also the mildness of their foam.

These improvements are such that it is possible, by the addition of anionic polymer(s), to reduce the concentration of surface-active agents in washing and foaming compositions without reducing their detergency, and this is economically advantageous. Furthermore, the compositions are well tolerated by the skin and mucous membranes.

These non-ionic surface-active agents may be of the polyoxyethyleneated, polyglycerolated, polyglycidolated type and polyglycosylated type.

These surprising results are obtained using the said non-ionic surface-active agent or agents and the said anionic polymer or polymers in particular proportions such that the ratio of anionic polymers(s)/non-anionic surface-active agent(s) is at least 0.1:1. Moreover, the compositions should not contain large proportions of cationic derivatives and, in particular, they must not contain cationic polymers.

The present invention therefore relates to new washing and foaming compositions containing at least one non-ionic surface-active agent and at least one anionic polymer as well as to a process for washing or cleaning keratin fibres, and in particular human hair, and the skin, using such compositions.

The washing and foaming compositions according to the invention contain at least one polyoxyethyleneated, polyglycerolated, polyglycidolated or polyglycosylated non-ionic surface-active agent together with at least one anionic polymer, the weight ratio of the anionic polymer to the non-ionic surface-active agent is greater than 0.1:1 and preferably 0.125:1 to 2.25:1.

In 10% aqueous solution, the non-ionic surface-active agents used have a detergency which is greater than or equal to that of a 2% aqueous solution of sodium lauryl-sulphate in the following test.

Determination of detergency

A determined quantity of sebum is deposited on wool samples in the form of a spot. After the samples have been washed under standard conditions in an automatic machine and dried, the residual quantity of sebum is revealed by developing with osmic acid. This gives a spot whose colouration ranges from pale grey to black, according to the quantity of sebum remaining: the darker the spot, the greater the quantity of sebum remaining and the lower the detergency of the composition studied.

The following method is used and all the measurements are carried out in duplicate. 70 mg of artificial sebum having the following composition:

97% squalene	19%
Cholesterol puriss.	5%
Technical-grade triolein	45%
Pure oleic acid	31%

are applied to a sample of virgin wool. The sample is then washed in an automatic machine consisting essentially of a moving plate, a pressure roller and jets delivering the rinsing water.

When active, the plate is driven with a reciprocating movement at a frequency of 20 passes per minute (+ or − 3 seconds).

After the sample have been fixed to the plate, 0.75 ml of the composition to be tested is deposited on the fabric and 60 roller passes are carried out (3 minutes). The sample is then rinsed by dispersing 240 ml of water and moving the plate and roller for 3 minutes (60 passes).

The washing is then repeated with 0.5 ml of the composition to be tested, 60 roller passes and rinsing with 240 ml of water and 120 roller passes (6 minutes).

The residual sebum is developed with osmic acid vapours. In a leaktight box, osmic acid is released and left in contact with the sample for 5 minutes, this period of time being sufficient to complete the reaction with the sebum.

The intensity of the colour of the spot is measured by a visual method, a sodium lauryl-

sulphate solution containing X% of sodium lauryl-sulphate being taken as the standard. The intensity of the spot of the composition to be tested is compared with the most similar intensity of the sodium lauryl-sulphate solution. Standard solutions containing varying concentrations of sodium lauryl-sulphate are used for this purpose.

The detergent activity is expressed as equivalents of sodium lauryl-sulphate.

The preferred surface-active agents are glucoside alkyl ethers or condensation products of monoalcohols, α-diols, alkylphenols or alkanolamides with glycidol, or glycidol precursors.

The compounds which are particularly valuable and which lead to an improved detergency when they are used in association with anionic polymers are the compounds of the formula:

$$R_1-CHOH-CH_2-O-(CH_2-CHOH-CH_2-O)-_pH$$

in which R_1 denotes an aliphatic, cycloaliphatic or arylaliphatic radical having from 7 to 21 carbon atoms, or a mixture thereof, it being possible for the aliphatic chains to contain ether, thioether or hydroxymethylene groups, and in which p is from 1 to 10, these compounds being described more particularly in French Patent 2,091,516; compounds of the formula:

$$R_2O[-C_2H_3O(CH_2OH)-]-_qH$$

in which R_2 denotes an alkyl, alkenyl or alkylaryl radical and q has an average statistical value of from 1 to 10, these compounds being described more particularly in French Patent 1,477,048; and compounds of the formula:

$$R_3CONH-CH_2-CH_2-O-CH_2-CH_2-O-[-CH_2-CHOH-CH_2-O-]-_rH$$

in which R^3 denotes a linear or branced, saturated or unsaturated aliphatic radical, or a mixture of such radicals, which can optionally contain one or more hydroxyl groups, has 8 to 30 carbon atoms and is of natural or synthetic origin, and r represents an integer or decimal number from 1 to 5 and denotes the average degree of condensation, these compounds being described more particularly in French Patent 2,328,763.

The non-ionic surface-active agents which give particularly advantageous results in the compositions according to the invention have the formulae:

(1) $R_1-CHOH-CH_2-O-(CH_2-CHOH-CH_2-O-)-_pH$

in which R_1 denotes a mixture of alkyl radicals having from 9 to 12 carbon atoms and p has a statistical value of about 3.5;

(2) $R_2-O-[C_2H_3O-(CH_2OH)-]-_qH$

in which R_2 denotes $C_{12}H_{25}$ and g has a statistical value of 4 to 5;

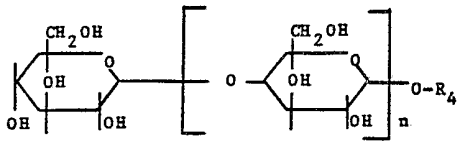
(3) $R_2-O-[-C_2H_3O(CH_2OH)-]-_qH$

in which R_2 denotes a mixture of alkyl radicals having 10 to 12 carbon atoms and q has a statistical value of about 3.75;

(4) $R_3-CONH-CH_2-CH_2-O-CH_2-CH_2-O-[CH_2CHOH-CH_2-O-]-_rH$

in which R_3 denotes a mixture of radicals derived from lauric, myristic, oleic and copra acids and r has a statistical value of 3 to 4; and

(5)

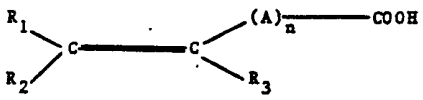


in which R_4 denotes an alkyl radical having 8 to 10 carbon atoms and n is equal to 0, 1, 2, 3 or 4, which is sold under the name TRITON CG 110 by SEPPIC.

The anionic polymers used according to the invention are polymers having a molecular weight of from 500 to 6,000,000 and preferably of from 5000 to 1,000,000, and containing

carboxylic or sulphonic acid groups.

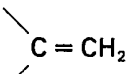
The carboxylic acid groups are especially derived from unsaturated monocarboxylic or dicarboxylic acids represented by the formula:



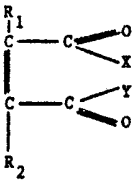
in which n is 0 or an integer from 1 to 10, A denotes a methylene group optionally joined to the carbon atom of the unsaturated group via a heteroatom such as oxygen or sulphur or, if n is greater than 1, the A groups can optionally be interrupted by a heteroatom, R_1 denotes a hydrogen atom or a phenyl or benzyl group, R_2 denotes a hydrogen atom or a lower alkyl or carboxyl group and R_3 denotes a hydrogen atom, a lower alkyl group, $-CH_2-COOH$ or a phenyl or benzyl group.

In the above formula, the lower alkyl radicals preferably denote a group having from 1 to 4 carbon atoms, such as methyl or ethyl.

Among these polymers, those which are more particularly preferred are acrylic or methacrylic acid homopolymers or copolymers such as the products sold under the name GOODRITE K732 by GOODRITE, VERSICOL E or K by ALLIED COLLOIDS, and ULTRAHOLD 8 by CIBA-GEIGY, the sodium salts of acrylic acid/acrylamide copolymers sold under the name RETEN 421, 423 or 425 by HERCULES, the sodium polymethacrylate sold under the name DARVAN No. 7 by Van der BILT, the polyhydroxycarboxylic acid polymers sold under the name HYDAGEN F by HENKEL, and optionally mono-esterified, unsaturated polymers containing an α,β dicarboxylic acid unit, such as the copolymers resulting from the copolymerization of a compound containing a group



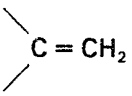
with a compound of the formula:



in which R_1 and R_2 independently of one another denote hydrogen, halogen or a sulphonic acid, alkyl, aryl or aralkyl group, X denotes OH and Y denotes OH, O-alkyl, O-aryl, HN-alkyl, NH-aryl or NH-cycloalkyl, or alternatively X and Y together denote O i.e. an anhydride link is present.

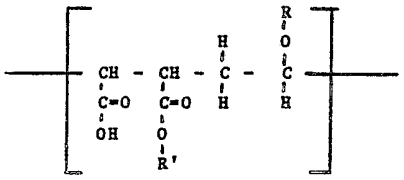
There may be mentioned, in particular, unsaturated α,β-dicarboxylic acids such as maleic, fumaric, itaconic, citraconic, phenylmaleic, benzylmaleic, dibenzylmaleic and ethylmaleic acids or the anhydrides of these acids, such as maleic anhydride, and also other derivatives such as the half-esters of these acids.

Examples which may be mentioned of compounds which can be polymerized and contain a group



are vinyl esters, vinyl ethers, vinyl halides, phenylvinyl derivatives such as styrene, acrylic acid and its esters, and cinnamic acid esters. These polymers are described in greater detail in, for example, U.S. Patent 2,047,398.

These polymers can optionally be esterified. More particularly valuable compounds are those described in U.S. Patents 2,723,248 and 2,102,113 which have units of formula:



in which R represents an alkyl group having 1 to 4 carbon atoms, such as methyl, ethyl, propyl, isopropyl, butyl or isobutyl, and R' represents an alkyl group having 1 to 8 carbon atoms, such as methyl, ethyl, propyl, butyl, isobutyl, pentyl, hexyl, heptyl, octyl or isooctyl.

Other polymers of this type which can be used according to the invention are copolymers of maleic anhydride and an olefine having from 2 to 4 carbon atoms, which are partially esterified (e.g. 50 to 70%) by an alcohol having from 1 to 4 carbon atoms, these copolymers being described more particularly in British Patent 839,805.

Other copolymers which can be used and which belong to this family are the copolymers resulting from the copolymerization of

(a) an unsaturated acid anhydride such as maleic, citraconic or itaconic anhydride, and

(b) an allyl or methallyl ester such as allyl or methallyl acetate, propionate, butyrate, hexanoate, octanoate, dodecanoate, octodecanoate, pivalate, neoheptanoate, neooctanate, neodecanoate, 2-ethylhexanoate, 2,2,4,4-tetramethylvalerate or 2-isopropyl-2,3-dimethylbutyrate.

The anhydride groups of these acids are either monoesterified with an aliphatic alcohol such as methanol, ethanol, propanol, isopropanol or n-butanol, or amidified with an aliphatic, cyclic or heterocyclic amine such as propylamine, isopropylamine, butylamine, dibutylamine, hexylamine, dodecylamine,. morpholine, piperidine, pyrrolidine or N-methylpiperazine.

It is also possible to use the terpolymers resulting from the copolymerization of the monomers is paragraphs a) and b) above with an acrylamide or methacrylamide such as N-tert.-butylacrylamide, N-octylacrylamide, N-decylacrylamide, N-dodecylacrylamide, N-[(1,1-dimethyl)-prop-1-yl]acrylamide, N-[(1,1-dimethyl)but-1-yl]acrylamide or N-[(1,1-dimethyl)pent-1-yl]acrylamide or the corresponding methacrylamides, the anhydride groups being esterified or amidified as indicated above.

The copolymers of this type can optionally also be copolymerized with α-olefines such as prop-1-ene, but-1-ene, hex-1-ene, dodec-1-ene, hexadec-1-ene and octadec-1-ene, vinyl ethers such as methyl vinyl ether, ethyl vinyl ether, propyl vinyl ether, isopropyl vinyl ether, butyl vinyl ether, hexyl vinyl ether, dodecyl vinyl ether, hexadecyl vinyl ether and octadecyl vinyl ether, acrylic or methacrylic acid esters such as methyl, ethyl, propyl, isopropyl, butyl, tert.-butyl, hexyl, octyl, decyl, dodecyl, octadecyl, 2,3-dihydroxypropyl, ω-methylpolyethylene glycol and ω-ethylpolyethylene glycol acrylates and methacrylates, and, if appropriate, acrylic or methacrylic acid or N-vinylpyrrolidone in the case of the terpolymers. Polymers of this type are described in, e.g., French Patents 2,350,834 and 2,357,241.

Among the polymers belonging to this family, there may also be mentioned the polymers derived from the maleic and itaconic acids and anhydrides mentioned above, and their copolymers with a monoethylenic unsaturated monomer such as ethylene, vinylbenzene, vinyl acetate, vinyl methyl ether or acrylamide, optionally hydrolyzed in the case of the anhydrides.

The polymers which are more particularly preferred are the products sold under the names Gantrez AN 119, 139, 149 and 169, which are maleic anhydride/methyl vinyl ether copolymers (1:1), and Gantrez ES 225, 335, 425 and 435, which are respectively the monoethyl ester, monoisopropyl ester and monobutyl ester of poly(methyl vinyl ether/maleic anhydride), sold by General Aniline, EMA 91, which is the ethylene/maleic anhydride copolymer solid by the MONSANTO COMPANY, EMA 1325, which is the mono-n-butyl (poly)ethylene maleate sold by the MONSANTO COMPANY, and also the product sold under the name Gantrez S 95, which is the hydrolyzed form of poly(methyl vinyl ether/maleic anhydride).

It is also possible to use polyacrylamides containing carboxylate groups, sold especially by American Cyanamid under the name CYANAMER A 370.

Polymers containing sulphonic acid groups which can be used according to the invention are especially polyacrylamidesulphonic acid salts such as those mentioned in U.S. Patent 4,128,631, and more particularly the polyacrylamidoethylpropanesulphonic acid sold under the name COSMEDIA POLYMER HSP 1180 by HENKEL.

These compositions must not contain cationic polymers, which would detract from the desired effect of the anionic polymer.

The total concentration of surface-active agent is suitably 0.5 to 20% and preferably 2 to 8% by weight of active ingredient. The total concentration of anionic polymer is suitably 0.05 to 15% and preferably 1 to 8% by weight of active ingredient. These compositions generally have

a pH of 2 to 10 and preferably of 3 to 9. The pH can be adjusted with known alkalizing or acidifying agents normally used in this type of washing composition.

According to the invention, the compositions may also contain anionic surface-active agents. It should be noted, however, that the improvement in detergency afforded by association of the anionic polymer with the non-ionic surface-active agents mentioned above makes it possible to use a much smaller quantity of anionic surface-active agents than it would have been necessary to use in order to have a similar detergency effect in the presence of the same non-ionic surface-active agent. Furthermore, this use of a reduced quantity of anionic surface-active agents makes it possible to prepare shampoos having very good detergency and foaming properties while at the same time being very mild towards the skin.

These surface-active agents are in themselves well known.

The compositions can take various forms normally used for compositions for washing or cleaning the hair or skin, and can be presented especially in the form of aqueous or aqueous-alcoholic solutions which may or may not be thickened, creams, gels, dispersions, emulsions or aerosol foams. In addition to the non-ionic surface-active agents or agents defined above and the anionic polymer or polymers in the proportions indicated, they can contain adjuvants normally used in cosmetics, with the exception of cationic polymers, and especially perfumes, colourants, preservatives, sequestering agents, thickeners, emulsifying agents, softeners, electrolytes, non-ionic polymers, foam stabilizers and the like, according to the application envisaged.

These compositions can be used in the form of shampoos, bath foams, make-up remover compositions for the skin or eyes, or compositions for washing the skin.

The present invention also provides a process for washing and cleaning the skin or hair, which is essentially characterized in that at least one composition of this invention is applied to the hair or skin, and in that, if appropriate, after application, the hair or skin is rinsed with water by the traditional methods used in this field.

The Examples which follow further illustrate the present invention.

EXAMPLE 1

A shampoo having the following composition is prepared:

Non-ionic surface-active agent of the formula:

$$R-CHOH-CH_2O-(CH_2-CHOH-CH_2O)_n-H$$

in which R is a mixture of C_9–C_{12} alkyl radicals and n represents an average statistical value of about 3.5	5 g
Methyl vinyl ether/maleic anhydride copolymer sold under the name GANTREZ AN 119 by GENERAL ANILINE and hydrolyzed with sodium hydroxide	5 g
Water, perfume, preservative, colourant q.s. pH = 7 with HCl	100 g

This composition has a greater detergency than that corresponding to 10% of surface-active agent in solution in water and at the same pH.

When applied to dirty hair, it develops a very mild foam and washes the hair perfectly. The wet hair is not tangled and the dried hair is bouncy, smooth and shiny.

EXAMPLE 2

A shampoo having the following composition is prepared:

Surface-active agent of the formula:

$$RCHOHCH_2O-[-CH_2-CHOH-CH_2O-]-_nH$$

in which R is a mixture of C_9–C_{12} alkyl radicals and n = 3.5 (statistical value)	5 g
Polyacrylic acid having an appropriate molecular weight of 1 million, sold as a solution containing 15% of active ingredient in water under the name VERSICOL E13 by ALLIED COLLOIDS	5 g A.I.
Water, perfume preservative, colourants q.s. pH = 7 with sodium hydroxide	100 g

This composition has a greater detergency than that corresponding to 5% of the same

surface-active agent.

EXAMPLE 3

The following composition is prepared:

Polyglycerolated fatty diglycolamide:

$R-CO-NHCH_2-CH_2-O-CH_2-CH_2-[-O-CH_2-CHOH-CH_2-]-_{3.5}OH$

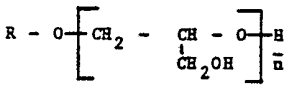
in which R = $C_{11}-C_{18}$ natural fatty amides	5 g Al
Polyacrylic acid of appropriate molecular weight 230,000, containing 25% of Al (active ingredient), sold under the name (VERSICOL E 11 by ALLIED COLLOIDS	3 g Al
Water, perfume, preservative(s), colourant(s) q.s.	100 g
pH = 6.3 with sodium hydroxide	

This composition is used as a shampoo for washing the hair.

EXAMPLE 4

The following composition is prepared:

Non-ionic surface-active agent prepared from a mixture of fatty alcohols:



in which R = $C_{10}H_{21}/C_{12}H_{25}$ in the molar ratio 54/56 and n = 3.75	5 g Al
Maleic anhydride/ethylene copolymer sold under the name EMA 91 by MONSANTO (used in the form of the sodium salt after hydrolysis with sodium hydroxide)	0.6 g Al
Water, perfume, colourant(s), preservative(s)	100 g
pH = 6.6 with hydrochloric acid.	

This composition is used as a shampoo.

EXAMPLE 5

The following composition is prepared:

Glucoside alkyl ether sold as a solution containing 30% of Al under the name TRITON CG 110 by SEPPIC	7 g Al
Sodium salt of a polyhydroxycarboxylic acid, sold under the name HYDAGEN F by HENKEL	3 g Al
Water, perfume, preservative q.s.	100 g
pH = 7.0, adjusted with sodium hydroxide.	

This composition is used as a shampoo for washing the hair.

EXAMPLE 6

The following composition is prepared:

Glucoside alkyl ether sold as a solution containing 30% of Al under the name TRITON CG 110 by SEPPIC	8 g Al
Modified polyacrylamide sold under the name CYANAMER A 370 by AMERICAN CYANAMID	2 g Al
Water, perfume, preservative q.s.	100 g
pH = 7.5, adjusted with sodium hydroxide.	

This composition is used as a shampoo for washing the hair.

EXAMPLE 7

The following composition is prepared:

Non-ionic surface-active agent of the formula:

$R-CHOH-CH_2O-(CH_2-CHOH-CH_2O-)_nH$

in which R = mixture of C_9-C_{12} alkyl radicals and n = average statistical value of about 3.5 — 5 g
COSMEDIA POLYMER HSP 1180 — 1 g
Water, perfume, preservative q.s. — 100 g
pH = 3, adjusted with Hydrochloric acid

This composition is used as a shampoo for washing the hair.

EXAMPLE 8

The following composition is prepared:

Glycerolated fatty diglycolamide, in approximately 30% solution, of the formula:

$R-CO-NHCH_2-CH_2-O-CH^2-CH_2-(O-CH_2-CHOH-CH_2)_{3.5}-OH$

in which R = $C_{12}-C_{18}$ natural fatty amides — 7 g
Modified polyacrylamide sold under the name CYANAMER A 370 by AMERICAN CYANAMID — 3 g
Water, perfume, preservative q.s. — 100 g
pH = 7.5, adjusted with triethanolamine

This composition is used as a shampoo for washing the hair.

EXAMPLE 9

The following composition is prepared:

Non-ionic surface-active agent based on polyglycerolated lauryl alcohol (4.2 mol of glycerol), as a solution containing about 60% of active ingredient, of the (statistical) formula:

$C_{12}H_{25}-[-O-CH_2-CH(CH_2OH)-]_{-4.2}-OH$ — 6 g

Sodium salt of a polyhydroxycarboxylic acid, sold under the name HYDAGEN F by HENKEL — 4 g
Water, perfume, preservative q.s — 100 g
pH = 7.25, adjusted with hydrochloric acid.

This composition is used as a shampoo for washing the hair.

EXAMPLE 10

The following composition is prepared:

Glucoside alkyl ether sold as a solution containing 30% of AI under the name TRITON CG 110 by SEPPIC — 6 g AI
Polymethacrylic acid of approximate MW 10,000, containing 25% of AI, sold under the name VERSICOL K 11 by ALLIED COLLOIDS — 3.2 g
Water, perfume, perservative q.s. — 100 g
pH = 7.3, adjusted with hydrochloric acid.

This composition is used as a shampoo for washing the hair.

Table I which follows relates to other examples of the invention.

The compositions of Examples 11 to 15 and 18 to 25 are used as shampoos for washing the hair, the composition of Example 16 is used as a lotion for cleaning the body and the composition of Example 17 is used as a make-up remover for the eyes.

TABLE I

Example	Surface-active agent S.A.A.	Concentration % AI	Anionic polymer	Concentration % AI	pH	Adjusted with
11	S.A.A.1	5	GANTREZ S 95	3	7	Hydrochloric acid
12	S.A.A.1	4	VERSICOL K 11	3	5.6	Hydrochloric acid
13	S.A.A.2	7	GANTREZ S 95	5	6.2	Hydrochloric acid
14	S.A.A.3	3	GANTREZ S 95	3	8.7	Sodium Hydroxide
15	TRITON CG 110	3	GANTREZ S 95	4	4.5	Hydrochloric acid
16	S.A.A.3	3	DARVAN 7	1	7.7	Hydrochloric acid
17	S.A.A.2	0.5	GANTREZ ES 425	0.5	4.9	Hydrochloric acid
18	S.A.A.1	5	RETEN 423	5	7	
19	S.A.A.1	9	GANTREZ S 95	1.4	7	
20	S.A.A. 1	5	GANTREZ S 95	1	7	
21	S.A.A.1	5	GANTREZ ES 425	5	7	
22	S.A.A.2	5	COSMEDIA POLYMER HSP 1180	5	7	
23	S.A.A. 3	5	COSMEDIA POLYMER HSP 1180	5	7	
24	TRITON CG 110	5	COSMEDIA POLYMER HSP 1180	5	7	
25	S.A.A.1	5	GOODRITE K 732	5	7	

In the above table, the tradenames or the abbreviations denotes the following products:
GANTREZ ES 425 Monobutyl ester of poly(methyl vinyl ether/maleic acid), sold by GENERAL ANILINE
DARVAN 7 Sodium salt of methacrylic acid homopolymer, sold as a 25% solution by VANDERBILT
GANTREZ S 95 Hydrolyzed poly(methyl vinyl ether/maleic anhydride) sold by GAF
VERSICOL K 11 Methacrylic acid polymer of MW 10,000, sold by ALLIED COLLOIDS
RETEN 423 Acrylamide/sodium acrylate copolymer sold by HERCULES
GOODRITE K 732 Polyacrylic acid of MW 5,000, sold by GOODRITE
COSMEDIA POLYMER HSP 1180 Polyacrylamidomethylpropane-sulphonic acid sold containinf 15% of AI by HENKEL
S.A.A. 1 Surface-active agent of the formula:

$$R-CHOH-CH_2-[-O-CH_2-CHOH-CH_2-O-]_n-H$$

in which R = mixture of C_9–C_{12} alkyl radicals and n represents an average statistical value of about 3.5
S.A.A. 2 Non-ionic surface-active agent based on polyglycerolated lauryl alcohol (4.2 mol of glycerol), as a solution containing 60% of AI, of the statistical formula:

$$C_{12}H_{25}-[-O-CH_2-\underset{\displaystyle HOH_2C}{\underset{|}{CH}}-]_{4.2}-OH$$

S.A.A. 3 Polyglycerolated fatty diglycerolamide

$$R-CO-NH-CH_2-CH_2-O-CH_2-CH_2-[-O-CH_2-CHOH-CH_2-]_{3.5}-OH$$

in which R = C_{12} to C_{18} natural fatty acid amides
TRITON CG 110 Glucoside alkyl ether sold as a solution containing 30% of AI by SEPPIC.

CLAIMS

1. A washing and foaming composition which comprises at least one non-ionic surface-active agent which, as a 10% by weight aqueous solution, has a detergency which is greater than or equal to that of a 2% by weight aqueous solution of sodium lauryl-sulphate, and at least one anionic polymer in proportions such that the weight ratio of anionic polymer:non-ionic surface-active agent is greater than 0.1:1, but containing substantially no cationic polymer.
2. A composition according to Claim 1, in which the weight ratio of anionic polymer:non-ionic surface-active agent is from 0.125:1 to 2.25:1.
3. A composition according to Claim 1 or 2, in which the non-ionic surface-active agent is a glucoside alkyl ether or a condensation product of a monoalcohol, and α-diol, an alkylphenol or an alkanolamide with glycidol or a glycidol precursor.
4. A composition according to Claim 3, in which the non-ionic surface-active agent is
— a product of the formula:

$$R_1-CHOH-CH_2-O-(CH_2-CHOH-CH_2-O-]_p-H$$

in which R_1 denotes an aliphatic, cycloaliphatic or arylaliphatic radical having from 7 to 21 carbon atoms, or a mixture thereof, it being possible for the aliphatic chains to contain one or more ether, thioether or hydroxymethylene groups, and p is from 1 to 10;
—a product of the formula:

$$R_2O-[-C_2H_3O(CH_2OH)-]_q-H$$

in which R_2 denotes an alkyl, alkenyl or alkylaryl radical and q has a statistical value of from 1 to 10; and
—a product of the formula:

$$R_3CONH-CH_2-CH_2-O-CH_2CH_2-O-[CH_2-CHOH-CH_2-O-]_r-H$$

in which R_3 denotes a linear or branched, saturated or unsaturated aliphatic radical, or a mixture of such radicals, which can optionally contain one or more hydroxyl groups, has 8 to 30 carbon atoms, and r represents an interger or decimal number from 1 to 5 and denotes the average degree of condensation.

5. A composition according to Claim 4, in which the non-ionic surface-active agent has the formula:

$$R_1-CHOH-CH_2-O-(CH_2-CHOH-CH_2-O-]-_pH$$

in which R_1 denotes a mixture of alkyl radicals having from 9 to 12 carbon atoms and p has a statistical value of about 3.5.

6. A composition according to Claim 4, in which the surface-active agent has the formula:

$$R_2-O-[C_2H_3O-(CH_2OH)-]-_qH$$

in which R_2 denotes $C_{12}H_{25}$ and q has a statistical value of 4 to 5, or alternatively R_2 denotes a mixture of $C_{10}H_{21}$ and $C_{12}H_{25}$ radicals and q has a statistical value of about 3.75.

7. A composition according to Claim 4, in which the non-ionic surface-active agent has the formula:

$$R-CONH-CH_2-CH_2-O-CH_2-CH_2-O-[CH_2CHOH-CH_2-O-]-_rH$$

in which R_3 denotes a mixture of radicals derived from lauric, myristic, oleic and copra acids and r has a statistical value of 3 to 4.

8. A composition according to Claim 3, in which the non-ionic surface-active agent is a glucoside alkyl ether of the formula:

Take in illustration
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in which R_4 denotes an alkyl radical having 8 to 10 carbon atoms and n is equal to 0, 1, 2, 3 or 4.

9. A composition according to any one of Claims 1 to 8, in which the anionic polymer is a polymer having a molecular weight of from 500 to 6,000,000 and containing carboxylic or sulphonic acid groups.

10. A composition according to any one of Claims 1 to 9, in which the anionic polymer is a polymer derived from an unsaturated monocarboxylic or dicarboxylic acid of the formula:

Take in illustration
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in which n is O or an integer from 1 to 10, A denotes a methylene group optionally joined to the carbon atom of the unsaturated group via a heteroatom, if n is greater than 1, the A groups can optionally be interrupted by a heteroatom, R_1 denotes a hydrogen atom or a lower alkyl or benzyl group, R_2 denotes a hydrogen atom or a lower alkyl or carboxyl group and R_3 denotes a hydrogen atom, a lower alkyl group, a $-CH_2-COOH$ group or a phenyl or benzyl group.

11. A composition according to Claim 10, in which the anionic polymer is an acrylic or methacrylic acid homopolymer or copolymer, an acrylamide carboxylic acid copolymer, a polyhydroxycarboxylic acid polymer, or a polymer derived from maleic, fumaric, itaconic, citraconic, phenylmaleic, benzylmaleic, dibenzylmaleic or ethylmaleic acid, or derived from an anhydride, or from a half-ester of said acids, optionally copolymerized with a compound containing a $C = CH_2$ group such as ethylene, a vinyl, an allyl or methallyl ester, a vinyl ether, a vinyl halide, a phenylvinyl derivative, an acrylic or methacrylic acid or an ester thereof, a cinnamic acid ester, a substituted or unsubstituted acrylamide or methacrylamide, an α-olefin or N-vinylpyrrolidone or a cinnamic acid ester.

12. A composition according to Claim 9, in which the anionic polymer is a salt of a polyacrylamidesulphonic acid.

13. A composition according to any one of Claims 1 to 12, in which the surface-active agent is present in an amount of from 0.5 to 20% by weight.

14. A composition according to Claim 13, in which the surface-active agent is present in an amount of from 2 to 8% by weight.

15. A composition according to any one of Claims 1 to 14, in which the anionic polymer is present in an amount of from 0.05 to 15% by weight.

16. A composition according to Claim 15, in which the anionic polymer is present in an amount of from 1 to 8% by weight.

17. A composition according to any one of Claims 1 to 16, which has a pH of from 2 to 10.

18. A composition according to any one of Claims 1 to 17 which also contains an anionic surface-active agent.

19. A composition according to any one of Claims 1 to 18, which is in the form of an aqueous or aqueous-alcoholic, optionally thickened, solution, a cream, a gel, a dispersion, an emulsion or an aerosol foam.

20. A composition according to Claim 1 substantially as described in any one of the Examples.

21. A process for washing or cleaning keratin fibres or the skin, which comprises applying thereto at least one composition as claimed in any one of Claims 1 to 20.

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