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(54) Title: DETERGENT, SMOOTHING COSMETIC HAIR COMPOSITION, AND COSMETIC TREATMENT PROCESS USING THE SAID COMPOSITION

(57) Abstract: The present invention relates to a cosmetic composition comprising one or more amphoteric or zwitterionic surfactant(s), one or more anionic surfactant(s) chosen from those comprising at least one phosphate, sulfate or sulfonate function, one or more sulfureous reducing agent(s), one or more alkaline agent(s), and one or more surfactants chosen from alkylmonoglucosides and alkylpolyglucosides, the alkyl group of which comprises from 8 to 30 carbon atoms. The present invention also relates to a process for relaxing curls and/or for reducing the volume of the hair, using such a composition.



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Detergent, smoothing cosmetic hair composition, and cosmetic treatment process using the said composition

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Detergent, smoothing cosmetic hair composition, and cosmetic treatment process using the said composition

5 The present invention relates to a cosmetic hair treatment composition, for the detergence and smoothing of the hair, comprising, in a cosmetically acceptable medium, at least one amphoteric or zwitterionic surfactant, at least one anionic surfactant, at least one sulfureous reducing agent, at least one alkaline agent and at least one
10 surfactant of alkylmonoglucoside or alkylpolyglucoside type.

 The present invention also relates to cosmetic hair treatment processes using such a composition, and also to the uses of this composition for the detergence and/or smoothing of the hair.

 To obtain permanent reshaping of the hair such as smoothing of
15 the hair, straightening or relaxing of curls, the technique most frequently used consists, in a first stage, in opening the -S-S- disulfide bonds of keratin (keratocystine) using a composition that is generally basic containing a sulfureous reducing agent (reduction step) and then, after having rinsed, generally with water, the head of hair thus treated,
20 in reconstituting the said disulfide bonds in a second stage by applying to the hair placed beforehand under an oxidizing composition (oxidation step, also known as the fixing step) so as finally to give the hair the desired shape. The new shape given to the hair by such a chemical treatment is eminently long-lasting and especially shows
25 resistance to the action of washing with water or with shampoo, as opposed to simple standard techniques of temporary reshaping, such as hairsetting.

 Many products intended for smoothing or straightening the hair or for relaxing curls exist on the market.

30 The products intended for smoothing or straightening the hair are generally formulated using thiols and alkaline agents, whereas the products intended for relaxing curls rather contain products such as cysteine and derivatives thereof.

These products are generally applied to curly or voluminous hair in order to obtain more or less pronounced smoothing and a reduction in the volume and mass of the head of hair.

5 The application of these products is generally long, with a more or less long leave-on time depending on the product, the type of hair and the desired effect. It requires special know-how.

Furthermore, the reducing agents are generally used in high concentrations, and the pH values of the formulations are quite basic, which may lead to more or less pronounced degradation of the hair
10 fibre, in particular when the hair is dyed.

Finally, the use of such a smoothing treatment is generally a drastic choice for the consumer, who cannot regulate the level of smoothing according to his choice.

There is thus a real need to develop hair smoothing treatments
15 that are lighter than those existing in the prior art, which not only degrade the hair fibre less, but are also easy to apply and allow modulation of the smoothing effect, for example by resorting to repeated applications.

The Applicant has now discovered that the introduction of
20 certain sulfureous active agents into a particular shampoo base can satisfy the abovementioned objectives.

In particular, it has discovered that by introducing at least one sulfureous reducing agent and at least one alkaline agent into a shampoo base that is preferably weakly alkaline (close to neutrality)
25 and containing a particular combination of surfactants based on an amphoteric or zwitterionic surfactant, an anionic phosphate, sulfate or sulfonate surfactant, and an alkylmonoglucoside or alkylpolyglucoside surfactant, a shampoo composition that has smoothing activity on the hair can be obtained.

30 The application of such a composition is quick and simple, and does not require any particular know-how.

Furthermore, the application of this composition makes it possible to obtain a reduction in the volume of the head of hair, and/or relaxation of the hair curls, which is gradual. In particular, it is

possible to modulate the desired effect, by successive applications of such a shampoo.

5 In a particularly advantageous manner, the Applicant has also found that the use of a standard shampoo not containing any reducing agent, between two applications of the composition according to the invention, does not modify the smoothing or the curl relaxation (shampoo-remanent effect).

Furthermore, the composition according to the invention shows very good detergency and foaming properties.

10 In addition, the treatment using such a shampoo is mild, and does not degrade the hair fibres.

Finally, the compositions according to the present invention do not require the presence of preserving agents.

15 One subject of the present invention is thus a cosmetic composition comprising, in a cosmetically acceptable medium:

- a) one or more amphoteric or zwitterionic surfactant(s),
- b) one or more anionic surfactant(s) chosen from those comprising at least one phosphate, sulfate or sulfonate function,
- c) one or more sulfurous reducing agent(s),
- 20 d) one or more alkaline agent(s), and
- e) one or more surfactants chosen from alkylmonoglucosides and alkylpolyglucosides in which the alkyl group comprises from 8 to 30 carbon atoms.

25 The term "cosmetically acceptable medium" means a medium that is compatible with the hair.

The cosmetically acceptable aqueous medium comprises water or a mixture of water and of a cosmetically acceptable solvent chosen from C₁-C₄ lower alcohols, such as ethanol, isopropanol, tert-butanol or n-butanol; polyols such as propylene glycol; polyol ethers; C₅-C₁₀ alkanes; C₃-C₄ ketones, such as acetone and methyl ethyl ketone; 30 C₁-C₄ alkyl acetates, such as methyl acetate, ethyl acetate and butyl acetate; dimethoxyethane, diethoxyethane; and mixtures thereof.

The amphoteric or zwitterionic surfactants that may be used in the compositions according to the present invention may especially be chosen from aliphatic secondary or tertiary amine derivatives, in which the aliphatic group is a linear or branched chain containing from 8 to 22 carbon atoms and containing at least one anionic group (for example carboxylate, sulfonate, sulfate, phosphate or phosphonate); mention may also be made of (C₈-C₂₀)alkylbetaines, sulfobetaines, (C₈-C₂₀)alkylamido(C₆-C₈)alkylbetaines or (C₈-C₂₀)alkylamido(C₆-C₈)-alkylsulfobetaines.

Among the amine derivatives, mention may be made of the products sold under the name Miranol®, as described in US patents 2 528 378 and 2 781 354 and classified in the CTFA dictionary, 3rd edition, 1982, under the names Amphocarboxyglycinate and Amphocarboxypropionate, having the respective structures (I) and (II):



in which:

R_a represents an alkyl group derived from an acid R_a-COOH present in hydrolysed coconut oil, a heptyl, nonyl or undecyl group,

R_b represents a β-hydroxyethyl group, and

R_c represents a carboxymethyl group;

and



in which:

B represents -CH₂CH₂OX',

B' represents -(CH₂)_z-Y', with z = 1 or 2,

X' represents a -CH₂CH₂-COOH group or a hydrogen atom,

Y' represents -COOH or a -CH₂-CHOH-SO₃H group,

R_a' represents an alkyl group of an acid R_a'-COOH present in coconut oil or in hydrolysed linseed oil, an alkyl group, in particular a C₁₇ alkyl group and its iso form, an unsaturated C₁₇ group.

These compounds are classified in the CTFA dictionary, 5th edition, 1993, under the names disodium cocoamphodiacetate,

disodium lauroamphodiacetate, disodium caprylamphodiacetate, disodium capryloamphodiacetate, disodium cocoamphodipropionate, disodium lauroamphodipropionate, disodium caprylamphodipropionate, disodium capryloamphodipropionate, lauroamphodipropionic acid, cocoamphodipropionic acid.

By way of example, mention may be made of the cocoamphodiacetate sold by the company Rhodia under the trade name Miranol® C2M concentrate.

The amphoteric or zwitterionic surfactant(s) are preferably chosen from (C₈-C₂₀)alkylbetaines, sulfobetaines, (C₈-C₂₀)alkylamido(C₆-C₈)alkylbetaines and (C₈-C₂₀)alkylamido(C₆-C₈)alkylsulfobetaines, and mixtures thereof.

(C₈-C₂₀)alkylbetaines, (C₈-C₂₀)alkylamido(C₆-C₈)alkylbetaines and mixtures thereof are preferably used.

A zwitterionic surfactant that is particularly preferred is cocoamidopropylbetaine.

The amphoteric or zwitterionic surfactants(s) are preferably contained in an amount ranging from 0.1% to 25% by weight, preferably from 0.5% to 15% by weight and better still from 1% to 7% by weight relative to the total weight of the composition.

The composition according to the invention also contains one or more anionic surfactants, chosen from anionic surfactants comprising at least one phosphate, sulfate or sulfonate function.

Such anionic surfactants may be chosen especially from the salts of the following compounds: alkyl sulfates, alkyl ether sulfates, alkylamidoether sulfates, alkylaryl polyether sulfates, monoglyceride sulfates, alkylsulfonates, alkylamidesulfonates, alkylarylsulfonates, α -olefin sulfonates, paraffin sulfonates, alkylsulfosuccinates, alkyl ether sulfosuccinates, alkylamide sulfosuccinates, alkyl sulfoacetates, alkylsulfosuccinamates, acyl isethionates and N-acyltaurates, alkyl phosphates and alkyl ether phosphates, the alkyl and acyl groups of all these compounds comprising from 6 to 24 carbon atoms and the aryl group preferably denoting a phenyl or benzyl group. These compounds

may be monooxyethylenated or polyoxyethylenated, and may comprise up to 50 oxyethylene units.

5 These compounds are generally used in the form of salts, in particular the alkali metal salts such as the sodium salts, the ammonium salts, the amine salts, the amino alcohol salts or the salts of alkaline-earth metals, for example of magnesium.

10 Surfactants comprising a sulfate function, and in particular (C₈-C₁₈)alkyl sulfates, (C₈-C₁₈)alkyl ether sulfates comprising from 0 to 20 oxyethylene units, and mixtures of these compounds, are preferably used.

Examples that are especially mentioned include sodium lauryl ether sulfates comprising from 2 to 10 ethylene oxide units.

15 The anionic surfactants(s) comprising at least one phosphate, sulfate or sulfonate function are preferably contained in an amount ranging from 0.1% to 25% by weight, preferably from 0.5% to 15% by weight and better still from 1% to 7% by weight relative to the total weight of the composition.

20 The composition according to the present invention also contains one or more surfactants chosen from alkylmono-glucosides and alkylpolyglucosides in which the alkyl group comprises from 8 to 30 carbon atoms.

The alkylmonoglucosides and/or alkylpolyglucosides are preferably chosen from those in which the alkyl group comprises from 8 to 18 carbon atoms.

25 Examples of particularly preferred compounds that may be mentioned include cocoglucoside and copolyglucosides

30 The said glucoside(s) are preferably contained in an amount ranging from 0.1% to 25% by weight, preferably from 0.5% to 15% by weight and better still from 1% to 10% by weight relative to the total weight of the composition.

The composition according to the present invention may also advantageously comprise one or more anionic surfactant(s) comprising at least one carboxylate function, i.e. a function -COO⁻, other than the

anionic surfactants (b). Such surfactants therefore do not comprise any phosphate, sulfate or sulfonate functions.

Such anionic surfactants may be chosen especially from the salts of the following compounds:

- 5 - acylsarcosinates and acylglutamates, in which the acyl groups comprise from 6 to 24 carbon atoms;
- monoesters of C₆-C₂₄ alkyl and of (poly)glucoside-dicarboxylic acids, such as alkyl polyglucoside citrates and alkyl polyglucoside tartrates, the alkyl groups of these compounds
10 preferably comprising from 12 to 20 carbon atoms;
- acyl-lactylates in which the acyl group comprises from 8 to 20 carbon atoms;
- alkyl-D-galactoside uronic acids, in which the alkyl groups comprise from 6 to 24 carbon atoms;
- 15 - polyoxyalkylenated (C₆-C₂₄)alkyl ether carboxylic acids, polyoxyalkylenated (C₆-C₂₄)alkyl(C₆-C₂₄)aryl ether carboxylic acids and polyoxyalkylenated (C₆-C₂₄)alkylamido ether carboxylic acids, in particular those comprising from 2 to 50 ethylene oxide units,
- and mixture of these compounds.

20 These compounds are generally used in the form of salts, in particular alkali metal salts such as sodium salts, ammonium salts, amine salts, amino alcohol salts or salts of alkaline-earth metals, for example of magnesium.

25 Preferably, the anionic surfactants comprising at least one carboxylate function are chosen from the salts of the following compounds: polyoxyalkylenated (C₆-C₂₄)alkyl ether carboxylic acids, polyoxyalkylenated (C₆-C₂₄)alkyl(C₆-C₂₄)aryl ether carboxylic acids and polyoxyalkylenated (C₆-C₂₄)alkylamido ether carboxylic acids, these acids comprising from 2 to 20 ethylene oxide units.

30 Among these compounds, it is preferred to use the salts of polyoxyalkylenated (C₆-C₂₄)alkyl ether carboxylic acids comprising from 2 to 20 ethylene oxide units, and even more preferentially the salts of polyoxyalkylenated (C₈-C₁₈)alkyl ether carboxylic acids comprising from 2 to 10 ethylene oxide units.

By way of example, mentioned is made especially of sodium lauryl ether carboxylates comprising from 2 to 10 ethylene oxide units.

The anionic surfactant(s) comprising at least one carboxylate function are preferably contained in an amount ranging from 0.1% to 25% by weight, preferably from 0.5% to 15% by weight and better still from 1% to 7% by weight relative to the total weight of the composition.

According to one preferred embodiment, the composition according to the invention comprises one or more surfactant(s) chosen from alkylmonoglucosides and alkylpolyglucosides as described above, and one or more anionic surfactant(s) comprising at least one carboxylate function as described above.

The composition according to the invention may also comprise one or more additional nonionic surfactants, other than the alkylmonoglucosides and alkylpolyglucosides of the invention.

The nonionic surfactants that may be used in the compositions of the present invention are compounds that are well known per se (see especially in this regard the *Handbook of Surfactants* by M.R. Porter, published by Blackie & Son (Glasgow and London), 1991, pp. 116-178). They may be chosen especially from polyethoxylated, polypropoxylated or polyglycerolated alcohols, polyethoxylated, polypropoxylated or polyglycerolated α -diols, polyethoxylated polypropoxylated or polyglycerolated (C₁-C₂₀)alkylphenols and polyethoxylated, polypropoxylated or polyglycerolated fatty acids, the fatty chain comprising, for example, from 8 to 18 carbon atoms, the number of ethylene oxide or propylene oxide groups possibly ranging especially from 2 to 50 and the number of glycerol groups possibly ranging especially from 2 to 30.

Mention may also be made of condensates of ethylene oxide and of propylene oxide with fatty alcohols; polyethoxylated fatty amides preferably containing from 2 to 30 ethylene oxide units, polyglycerolated fatty amides comprising on average from 1 to 5 glycerol groups and in particular from 1.5 to 4 glycerol groups, ethoxylated fatty acid esters of sorbitan containing from 2 to 30

ethylene oxide units, fatty acid esters of sucrose, fatty acid esters of polyethylene glycol, polyethoxylated plant oils, N-(C₆-C₂₄)alkyl glucamine derivatives, and amine oxides such as (C₁₀-C₁₄)alkyl-amine oxides or N-(C₁₀-C₁₄)acyl aminopropylmorpholine oxides.

5 When they are present, the amount of the additional nonionic surfactant(s) is preferably within the range from 0.01% to 20% by weight and better still from 0.05% to 10% by weight relative to the total weight of the composition.

10 The composition according to the present invention may also comprise one or more cationic surfactants.

 As examples of cationic surfactants, mention may be made especially of salts of optionally polyoxyalkylenated primary, secondary or tertiary fatty amines; quaternary ammonium salts such as tetraalkylammonium, alkylamidoalkyltrialkylammonium, trialkyl-
15 benzylammonium, trialkylhydroxyalkylammonium or alkylpyridinium chlorides or bromides; imidazoline derivatives; or amine oxides of cationic nature.

 When cationic surfactants are present, their amount is preferably within the range from 0.01% to 10% by weight, better still
20 from 0.05% to 5% by weight and even more preferentially from 0.3% to 3% by weight relative to the total weight of the cosmetic composition.

 The composition according to the present invention contains one or more sulfureous reducing agent(s). These agents are preferably
25 chosen from organic compounds comprising one or more mercapto groups (-SH), sulfites and sulfite derivatives.

 Among the sulfite derivatives, bisulfites and sulfite diesters of formula R-O-SO₂-R' with R and R' denoting C₁ to C₁₀ alkyl groups are essentially denoted.

30 The organic compounds comprising a mercapto group are preferably chosen from the following compounds: thioglycolic acid, thiolactic acid, cysteine, homocysteine, glutathione, thioglycerol, thiomalic acid, 2-mercaptopropionic acid, 3-mercaptopropionic acid, thiodiglycol, 2-mercaptoethanol, dithiothreitol, thioxanthine,

thiosalicylic acid, thiodiglycolic acid, lipoic acid, N-acetylcysteine, and thioglycolic or thiolactic acid esters, and mixtures of these compounds.

5 The sulfureous reducing agent(s) may especially be used in the form of salts, in particular alkali metal salts such as the sodium and potassium salts; alkaline-earth metal salts, for example the magnesium and calcium salts; the ammonium salts; the amine salts; the amino alcohol salts.

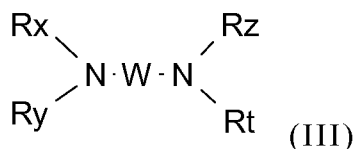
10 In a particularly preferred manner, the sulfureous reducing agent(s) are chosen from: thioglycolic acid and salts thereof, thiolactic acid and salts thereof, alkali metal sulfites and especially sodium sulfite, alkali metal bisulfites and especially sodium bisulfite, and precursors of these sulfites or bisulfites, such as sodium metabisulfite.

15 The sulfureous reducing agent(s) are preferably contained in an amount ranging from 0.1% to 5% by weight and preferably from 0.3% to 3% by weight relative to the total weight of the composition.

20 The alkaline agent used in the compositions according to the invention may be any agent for increasing the pH of the composition in which it is present. The alkaline agent may be a Bronsted, Lowry or Lewis base. It may be mineral or organic.

In particular, the alkaline agent may be chosen from:

- a) aqueous ammonia,
- b) alkanolamines such as monoethanolamine, diethanolamine, triethanolamine, isopropanolamine and 2-amino-2-methyl-1-propanol, and also derivatives thereof,
- c) oxyethylenated and/or oxypropylenated ethylenediamines,
- d) mineral or organic hydroxides,
- e) alkali metal silicates such as sodium metasilicates,
- f) amino acids, preferably basic amino acids such as arginine, lysine, ornithine, citrulline and histidine,
- g) carbonates and bicarbonates particularly of a primary, secondary or tertiary amine, of an alkali metal, of an alkaline-earth metal or of ammonium, and
- h) the compounds of formula (III) below:



in which W is a C₁-C₆ alkylene residue optionally substituted
 5 with a hydroxyl group or a C₁-C₆ alkyl radical; Rx, Ry, Rz and Rt,
 which may be identical or different, represent a hydrogen atom or a
 C₁-C₆ alkyl, C₁-C₆ hydroxyalkyl or C₁-C₆ aminoalkyl radical.

Examples of such compounds of formula (III) that may be
 mentioned include 1,3-diaminopropane, 1,3-diamino-2-propanol,
 10 spermine and spermidine.

The mineral or organic hydroxides are preferably chosen from:
 hydroxides of an alkali metal; hydroxides of an alkaline-earth metal,
 for instance sodium or potassium hydroxide; hydroxides of a transition
 metal, such as hydroxides of metals from groups III, IV, V and VI of
 15 the Periodic Table of the Elements; lanthanide or actinide hydroxides;
 quaternary ammonium hydroxides, and guanidinium hydroxide.

The hydroxide may be formed *in situ*, for instance guanidine
 hydroxide, formed by reaction of calcium hydroxide and guanidine
 carbonate.

20 The preferred alkaline agents are in particular aqueous
 ammonia, ammonium carbonate, ammonium bicarbonate, arginine,
 monoethanolamine and 2-amino-2-methyl-1-propanol.

The alkaline agent(s) as defined previously may represent, for
 example, from 0.001% to 20% by weight and preferably from 0.005%
 25 to 10% by weight relative to the total weight of the composition
 according to the invention.

The concentration of alkaline agent(s) is especially adjusted as
 a function of the desired pH for the composition.

Preferably, the composition according to the invention has a pH
 30 ranging from 7 to 10 and more preferentially from 7 to 8.

Also advantageously, the composition according to the invention may also comprise one or more swelling agents or emollients such as urea, glycols such as butylene glycol, hexylene glycol or propylene glycol, sorbitol, melamine, guanidine or glycerol.

5 Also advantageously, the composition according to the invention may also comprise one or more conditioning agents.

Examples that may be mentioned include linear, cyclic, branched or unbranched, volatile or non-volatile silicones. These silicones may be in the form of oils, resins or gums; they may in
10 particular be polyorganosiloxanes.

Organopolysiloxanes are defined in greater detail in Walter Noll's *Chemistry and Technology of Silicones* (1968) Academic Press. They may be volatile or non-volatile

When they are volatile, the silicones are more particularly
15 chosen from those with a boiling point of between 60°C and 260°C.

Cationic polymers especially such as polyquaterniums 22, 6, 10, 11, 35 and 37 and hexadimethrine chloride are most particularly preferred as conditioning agent.

The concentration of conditioning agent(s) in the composition
20 according to the invention may range from 0.01% to 10% by weight, preferably from 0.05% to 5% by weight and even more preferentially from 0.1% to 3% by weight relative to the total weight of this composition.

The composition in accordance with the invention may also
25 comprise one or more cosmetic adjuvants.

For example, it may comprise one or more conventional additives that are well known in the art, such as hair-loss counteractants, oxidizing agents, ceramides and pseudoceramides, vitamins and provitamins including panthenol, plant, animal, mineral
30 or synthetic oils, fatty alcohols, waxes, sunscreens, mineral or organic pigments, sequestrants, plasticizers, solubilizers, acidifying agents, mineral or organic thickeners, antioxidants, hydroxy acids, nacreous agents, fragrances and preserving agents.

Needless to say, a person skilled in the art will take care to select this or these optional additional compounds such that the advantageous properties intrinsically associated with the composition according to the invention are not, or are not substantially, adversely affected by the envisaged additions.

The above additives may in general be present in an amount for each of them of between 0 and 20% by weight relative to the total weight of the composition.

According to one preferred embodiment, the composition according to the invention is non-colouring, i.e. it does not significantly modify the colouration of the fibres onto which it is applied.

Another subject of the invention is a cosmetic treatment process that comprises the application to dry or wet hair of a composition as described above.

According to one preferred embodiment, such a process consists in applying the composition according to the present invention, and in optionally rinsing it out after an optional leave-on time.

According to one preferred embodiment, the process according to the invention comprises the following steps:

- applying the composition according to the invention to wet hair, and then

- leaving the composition on the hair, allowing a leave-on time that may range from 5 seconds to 60 minutes and preferably from 30 seconds to 15 minutes, at a temperature that may range from room temperature (about 25°C) to 230°C and preferably from room temperature to 60°C, and even more preferably at room temperature, and then

- rinsing the hair with water.

The hair may then be dried, for example under a hood or a hair dryer, or may be left to dry in the open air.

It is also possible to perform a step of placing the hair under tension, for example using a brush, a comb or tongs, at the time when

the hair is in contact with the composition according to the invention, or after rinsing it.

It is also possible to replace this step of placing under tension with a step of working the head of hair by hand or with a comb.

5 However, and this constitutes an advantage of the present invention, as soon as the composition is first applied, including its application without placing the hair under tension, a substantial reduction in the volume of the head of hair is observed. When the hair is curly, relaxing of the curls and/or better curl definition thereof is
10 also observed.

According to one preferred embodiment, the process according to the invention is repeated one or more times, until the desired level of smoothing is obtained.

15 Thus, a subject of the present invention is also a process for relaxing hair curls and/or for reducing the volume of the hair, which consists in applying the composition according to the invention one or more times to the hair. According to one preferred embodiment, the composition is applied several times, either consecutively or after a delay ranging from a few hours to a few days, each application being
20 followed by rinsing, until the desired level of relaxation and/or volume reduction is obtained.

The application of the composition according to the invention may be followed by the application of a rinse-out or leave-on hair care optionally containing a reducing agent.

25 A subject of the present invention is also the use of the composition according to the invention.

This composition may be advantageously used for hair detergency, for smoothing the hair or for a combined effect of detergency and smoothing.

30 In particular, the composition according to the invention may be applied before or after a smoothing or a standard permanent-waving treatment of the hair with or without fixing, in order to facilitate this treatment or to reinforce its efficacy (smoothing "booster" effect).

It may also be applied after a standard smoothing treatment, so as to maintain the smoothing of the hair, which makes it possible, for example, to space out the smoothing treatments generally performed with more aggressive compositions.

5 It may also be applied after a permanent-waving treatment, to modulate the degree of curliness.

The example that follows is given purely as an illustration of the present invention.

10

EXAMPLE:

Two shampoo compositions A and B, in accordance with the invention, were prepared from the ingredients indicated in the table below (in which the contents are indicated in grams of active material):

15

Composition	A	B
Cocoglucoside	5 g	5 g
Cocoamidopropylbetaine	5.4 g	5.4 g
Laureth-5 carboxylic acid	3 g	3 g
Sodium laureth sulfate containing 2.2 mol of ethylene oxide	4 g	4 g
Thioglycolic acid	1.4 g	-
Sodium metabisulfite	-	2 g
Arginine	-	qs pH = 7
Ammonium bicarbonate	qs pH = 8	
Pentasodium pentetate	0.16 g	0.16 g
Water	qs 100 g	qs 100 g

20

The above shampoo compositions were applied to heads of curly and/or voluminous hair, in the following manner: 12 to 15 g of

shampoo were applied to the wet head of hair, i.e. premoistened and drained using a terry towel.

The shampoo was then spread out carefully by massaging the head of hair.

5 After a leave-on time ranging from 2 to 5 minutes, the hair was rinsed thoroughly with water and then towel-dried, disentangled with a comb and dried with a hair dryer.

10 The Applicant found that the hair was clean, and showed a marked reduction in the volume of the head of hair. As regards curly hair, it was also found that the hair curls were more relaxed, with better curl definition.

The above treatment process may be repeated three times consecutively on the same head of hair. Accentuated results are then observed.

CLAIMS

1. Cosmetic composition, comprising, in a cosmetically acceptable medium:
 - a) one or more amphoteric or zwitterionic surfactant(s),
 - 5 b) one or more anionic surfactant(s) chosen from those comprising at least one phosphate, sulfate or sulfonate function,
 - c) one or more sulfureous reducing agent(s),
 - d) one or more alkaline agent(s), and
 - e) one or more surfactants chosen from alkylmonoglucosides
 - 10 and alkylpolyglucosides in which the alkyl group comprises from 8 to 30 carbon atoms.
2. Composition according to the preceding claim, characterized in that the amphoteric or zwitterionic surfactant(s) are chosen from:
 - 15 secondary or tertiary aliphatic amine derivatives, in which the aliphatic group is a linear or branched chain comprising from 8 to 22 carbon atoms and containing at least one anionic group; (C₈-C₂₀)alkylbetaines; sulfobetaines; (C₈-C₂₀)alkylamido(C₆-C₈)alkylbetaines; and (C₈-C₂₀)alkylamido(C₆-C₈)alkylsulfobetaines; and preferably from (C₈-C₂₀)alkylbetaines and (C₈-C₂₀)alkylamido(C₆-C₈)alkylbetaines, and mixtures thereof.
 - 20
3. Composition according to either of the preceding claims, characterized in that it contains the amphoteric or zwitterionic surfactant(s) in an amount ranging from 0.1% to 25% by weight, preferably from 0.5% to 15% by weight and better still from 1% to 7%
25 by weight relative to the total weight of the composition.
4. Composition according to any one of the preceding claims, characterized in that the anionic surfactant(s) comprising at least one phosphate, sulfate or sulfonate function are chosen from the salts of the following compounds: alkyl sulfates, alkyl ether sulfates,
30 alkylamidoether sulfates, alkylarylpolyether sulfates, monoglyceride sulfates, alkylsulfonates, alkylamidesulfonates, alkylarylsulfonates, α -olefin sulfonates, paraffin sulfonates, alkylsulfosuccinates, alkyl ether sulfosuccinates, alkylamide sulfosuccinates, alkyl sulfoacetates,

alkylsulfosuccinamates, acyl isethionates and N-acyltaurates, alkyl phosphates and alkyl ether phosphates, the alkyl and acyl groups of all these compounds comprising from 6 to 24 carbon atoms and the aryl group preferably denoting a phenyl or benzyl group, these compounds possibly being monooxyethylenated or polyoxyethylenated and comprising up to 50 oxyethylene units; and are preferably chosen from (C₈-C₁₈)alkyl sulfates and (C₈-C₁₈)alkyl ether sulfates comprising from 0 to 20 oxyethylene units, and mixtures of these compounds.

5. Composition according to any one of the preceding claims, characterized in that it contains the anionic surfactant(s) comprising at least one phosphate, sulfate or sulfonate function in an amount ranging from 0.1% to 25% by weight, preferably from 0.5% to 15% by weight and better still from 1% to 7% by weight relative to the total weight of the composition.

6. Composition according to any one of the preceding claims, characterized in that the surfactant(s) chosen from alkylmonoglucosides and alkylpolyglucosides are chosen from those in which the alkyl group comprises from 8 to 18 carbon atoms.

7. Composition according to any one of the preceding claims, characterized in that it contains the said glucoside(s) in an amount ranging from 0.1% to 25% by weight, preferably from 0.5% to 15% by weight and more preferentially from 1% to 10% by weight relative to the total weight of the composition.

8. Composition according to any one of the preceding claims, characterized in that it also contains one or more anionic surfactant(s) comprising at least one carboxylate function, other than the anionic surfactants (b), chosen from the salts of the following compounds: polyoxyalkylenated (C₆-C₂₄)alkyl ether carboxylic acids, polyoxyalkylenated (C₆-C₂₄)alkyl(C₆-C₂₄)aryl ether carboxylic acids and polyoxyalkylenated (C₆-C₂₄)alkylamido ether carboxylic acids, these acids comprising from 2 to 20 ethylene oxide units; and preferably from the salts of polyoxyalkylenated (C₆-C₂₄)alkyl ether carboxylic acids comprising from 2 to 20 ethylene oxide units.

9. Composition according to the preceding claim, characterized in that it contains the anionic surfactant(s) comprising at least one carboxylate function in an amount ranging from 0.1% to 25% by weight, preferably from 0.5% to 15% by weight and better still from 1% to 7% by weight relative to the total weight of the composition.

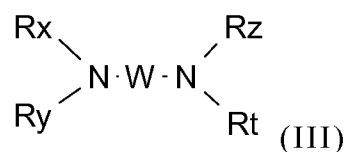
10. Composition according to any one of the preceding claims, characterized in that the sulfureous reducing agent(s) are chosen from organic compounds comprising one or more mercapto groups (-SH), sulfites and sulfite derivatives.

11. Composition according to the preceding claim, characterized in that the sulfureous reducing agent(s) are chosen from: thioglycolic acid and salts thereof, thiolactic acid and salts thereof, alkali metal sulfites, alkali metal bisulfites, and precursors of alkali metal sulfites or bisulfites.

12. Composition according to any one of the preceding claims, characterized in that it contains the sulfureous reducing agent(s) in an amount ranging from 0.1% to 5% by weight and preferably from 0.3% to 3% by weight relative to the total weight of the composition.

13. Composition according to any one of the preceding claims, characterized in that the alkaline agent is chosen from:

- a) aqueous ammonia,
- b) alkanolamines and also derivatives thereof,
- c) oxyethylenated and/or oxypropylenated ethylenediamines,
- d) mineral or organic hydroxides,
- e) alkali metal silicates,
- f) amino acids, preferably basic amino acids,
- g) carbonates and bicarbonates particularly of a primary, secondary or tertiary amine, of an alkali metal, of an alkaline-earth metal or of ammonium, and
- h) the compounds of formula (III) below:



in which W is a C₁-C₆ alkylene residue optionally substituted with a hydroxyl group or a C₁-C₆ alkyl radical; Rx, Ry, Rz and Rt, which may be identical or different, represent a hydrogen atom or a C₁-C₆ alkyl, C₁-C₆ hydroxyalkyl or C₁-C₆ aminoalkyl radical.

5 14. Composition according to any one of the preceding claims, characterized in that it also comprises one or more swelling agents or emollients and/or one or more conditioning agents.

10 15. Process for relaxing hair curls and/or for reducing the volume of the hair, which consists in applying a composition according to any one of the preceding claims one or more times to the hair, optionally before or after a smoothing or permanent-waving treatment of the hair.