

United States Patent

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Bolich, Jr. et al.

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[54] MILD SHAMPOO COMPOSITIONS

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252/DIG. 13; 252/DIG. 14; 424/70

[51] Int. Cl.² **C11D 1/92**

[58] Field of Search **252/545, 549, 554, 526,**
252/546, DIG. 13, DIG. 14, DIG. 7

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[57] ABSTRACT

Mild shampoo compositions comprise specific ethoxylated anionic surfactants, specific zwitterionic surfactants, and polyethoxylated nonionic surfactants.

16 Claims, No Drawings

MILD SHAMPOO COMPOSITIONS

BACKGROUND OF THE INVENTION

1. Field of the Invention

This invention relates to shampoo compositions, particularly those which are very mild and have a minimal tendency to sting the eyes.

2. Prior Art

Compositions containing the reaction products of ethoxylated anionic surfactants and certain specific amphoteric surfactants and polyethoxylated nonionic surfactants have been disclosed in U.S. Pat. Nos. 2,999,069 and 3,055,836, Masci and Poirier. Similar disclosures are contained in the corresponding foreign patent applications such as British Pat. Nos. 850,514, 850,515, and 921,122; and Canadian Pat. No. 595,532. In each of these patents, the disclosure is of a reaction product formed between the anionic surfactant and the amphoteric surfactant which contains ternary nitrogen groups.

The compositions of this invention are all extremely mild and have minimum or no eye sting. This is a very desirable combination of characteristics. For example, children cannot keep shampoo out of their eyes and the resulting pain can be extremely damaging to good relations between the parent and child. Yet, one would not want to have a shampoo which didn't sting, but which caused serious damage, since then one needs the pain to encourage a thorough rinsing of the eye. Thus, the combination of mildness and lack of eye sting is extremely desirable.

The prior art compositions discussed hereinbefore do sting the eyes, but less than conventional shampoos. The compositions of this invention are as mild and in many instances milder than the prior art compositions and in many instances sting the eyes less. It is surprising that zwitterionic compounds, of the type disclosed herein, are as mild or milder than the "reaction product" compositions of the prior art, when used in combination with the anionic and nonionic surfactants of this invention. Although, betaines and sultaines are well known in the art, the ability of applicants' three-component compositions to be used as shampoos without stinging eyes was unknown.

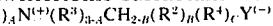
THE INVENTION

This invention relates to the discovery of a mild shampoo composition comprising:

A. a polyethoxylated anionic surfactant selected from the group consisting of (1) a surfactant having the formula $R(OC_2H_4)_nOSO_3M$, wherein R is a hydrophobic group selected from the group consisting of alkyl groups containing from about 8 to about 16 carbon atoms, alkylphenyl groups wherein the alkyl group contains from about 6 to about 15 carbon atoms, and fatty acid amido groups wherein the fatty acid contains from about 8 to about 16 carbon atoms, wherein n is a number from about 1 to about 10 (preferably 1 to 5) and M is a non-toxic cation which makes the surfactant water-soluble, preferably a cation selected from the group consisting of sodium, potassium, ammonium and triethanolammonium cations, and (2) a water-soluble (e.g., sodium, potassium, ammonium or triethanolammonium) polyethoxylated fatty alcohol sulfosuccinate monoester wherein said fatty alcohol contains from about 8 to about 16 carbon atoms, preferably from about 10 to about 14 carbon atoms, and said poly-

ethoxylated fatty alcohol contains from about 1 to about 10 ethoxy moieties per molecule, preferably from about 1 to 5;

B. a zwitterionic surfactant having the formula



wherein A, B, and C are each selected from the group consisting of 0 and 1, wherein A is 0 when B is 1 and A is 1 when B is 0, wherein C can only be 1 when Y is a sulfonate group, wherein each R² is selected from the group consisting of alkyl groups containing from about 8 to about 16 carbon atoms and a moiety having the formula R⁵ — C(O)NH — R⁶ — wherein R⁵ is an alkyl group containing from about 8 to about 16 carbon atoms and R⁶ is an alkylene group containing from 1 to about 5 carbon atoms (preferably 2-4 carbon atoms and most preferably 3 carbon atoms), wherein each R³ is selected from the group consisting of alkyl, hydroxyalkyl and alkoxyalkyl groups which can be connected to form a ring and each of which contains from 1 to about 3 carbon atoms, wherein Y is selected from the group consisting of sulfonate and carboxylate groups, and wherein R⁴ is an alkylene group containing from 1 to about 5 carbon atoms when Y is a carboxylate group and is selected from the group consisting of alkylene and hydroxyalkylene groups containing from about 2 to about 5 carbon atoms when Y is a sulfonate group and wherein the hydroxy group is on a secondary carbon atom;

C. a polyethoxylated nonionic surfactant selected from the group consisting of: (1) polyethoxylated alcohols, said alcohols containing an alkyl group, either primary or secondary, and either straight or branched chain, containing from about 8 to about 16 carbon atoms and said polyethoxylated alcohols containing from about 10 to about 45 ethoxy moieties per molecule, (2) polyethoxylated alkylphenols wherein the alkyl group contains from about 6 to about 15 carbon atoms and wherein the polyethoxylated alkylphenol contains from about 10 to about 45 ethoxy moieties per molecule, (3) polyethoxylated mono fatty acid esters of sorbitol wherein said fatty acids contain from about 8 to about 18 carbon atoms and said polyethoxylated mono fatty acid ester of sorbitol contains from about 10 to about 45 ethoxy moieties per molecule, (4) polyethoxylated polypropylene glycol, said polypropylene glycol having a molecular weight of from about 1,000 to about 15,000 and said polyethoxylated polypropylene glycol containing from about 15 to about 300 ethoxy moieties per molecule, and (5) polyethoxylated fatty acids wherein said fatty acid contains from about 8 to about 16 carbon atoms and said polyethoxylated fatty acid contains from about 10 to about 45 ethoxy moieties per molecule; and

D. water,

55 the molecular ratio of (A) to (B) being from about 1:1 to about 4:1; the weight ratio of (A) + (B) to (C) being from about 2:1 to about 1:2; and the pH of the composition being from about 6.0 to about 8.0.

DESCRIPTION OF THE INVENTION

1. The polyethoxylated anionic surfactant

The polyethoxylated anionic surfactants of this invention are very mild. It is essential that the anionic surfactant be mild since it is normally used in a molar excess over the amount of zwitterionic surfactant present so as to minimize the amount of cationic species present. The anionic surfactant provides good lather properties. Typically the composition will contain from

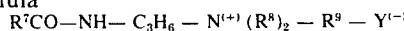
about 2 to about 15% of the anionic surfactant, preferably from about 4 to about 8% for a liquid shampoo, and from about 3 to about 10% for a paste shampoo. The sodium salts of the polyethoxylated anionic surfactants are preferred, but any non-toxic, water-soluble salt can be used, including potassium, triethanolammonium, and ammonium salts.

The preferred polyethoxylated anionic surfactants are the sodium salt of $C_{10}-C_{14}$ fatty alcohol polyethoxy(3) ether sulfate, the sodium salt of polyethoxylated(3) $C_{10}-C_{14}$ mono fatty alcohol sulfosuccinate, and the sodium salt of $C_{10}-C_{14}$ fatty acyl amido polyethoxy(4) ether sulfate. Other suitable polyethoxylated anionic surfactants are disclosed hereinafter in the examples.

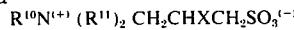
2. The zwitterionic surfactants

The zwitterionic surfactant provides major lather benefits while modifying the nature of the composition so that it is less strongly anionic. The molecular ratio of the anionic to zwitterionic surfactant is from about 1:1 to about 4:1, preferably from about 1:1 to about 3:1, most preferably from about 1:1 to about 2:1.

Preferred zwitterionic surfactants are propylamido betaines derived from $C_{10}-C_{16}$ fatty acids, and the corresponding propylamido sultaines, and $C_{10}-C_{16}$ alkyl sultaines wherein the cationic and sulfonate anionic groups are separated by a propylene group and the remaining groups are methyl groups. Specifically, preferred zwitterionic surfactants are (a) those having the formula



wherein R' is an alkyl group containing from about 9 to about 15 carbon atoms, wherein each R^8 is selected from the group consisting of methyl, ethyl, and 2-hydroxyethyl groups, wherein Y is selected from the group consisting of sulfonate and carboxylate groups, and wherein R^9 is a methylene group when Y is a carboxylate group and is selected from the group consisting of propylene and 2-hydroxypropylene groups when Y is a sulfonate group; and (b) those having the formula



wherein R^{10} contains from about 10 to about 16 carbon atoms, wherein each R^{11} is selected from the group consisting of methyl, ethyl, and 2-hydroxyethyl groups, and wherein X is selected from the group consisting of hydrogen and hydroxyl groups. Examples of other zwitterionic surfactants are given in the examples hereinafter.

3. The polyethoxylated nonionic surfactant

The polyethoxylated nonionic surfactant provides a mildness benefit. It also contributes to the character of the lather, although in general, the nonionic surfactant tends to control and diminish the amount of the lather. The ratio of the polyethoxylated anionic surfactant and zwitterionic surfactant to the polyethoxylated nonionic surfactant is from about 2:1 to about 1:2, preferably from about 1:1 to about 1:2, and most preferably from about 1:1 to about 1:1.2.

Preferred nonionic surfactants include polyethoxylated (15-40) sorbitan monoacylate ($C_{10}-C_{16}$; preferably monolaurate), polyethoxylated (20-100) polypropylene glycol (M.W. 8,000-12,000), and polyethoxylated (15-40) fatty alcohols ($C_{10}-C_{14}$). Other examples of nonionic surfactants are disclosed hereinafter in the examples.

4. Water

Water is used to make up the shampoo compositions to the desired physical form. For liquid shampoos, there will normally be from about 50 to about 85% of water present, preferably from about 65 to about 80%.

5 For a paste shampoo, there will normally be from about 30 to about 60% water present, preferably from about 35 to about 55%.

5. Other ingredients

In addition to the ingredients described hereinbefore, 10 the shampoo compositions of this invention can also contain other conventional shampoo components, including dyes, preservatives such as ethanol, perfumes, thickeners, opacifiers, antibacterial agents, antidandruff agents, buffering agents, conditioning agents, etc. Desirably, only ingredients which are not irritating to 15 the eye are added.

It is especially desirable and preferred to have buffering agents present to maintain the pH of the composition within the range from about 6.0 to about 8.0, preferably from about 6.5 to about 7.5, and most preferably, about 7. Such buffering agents include NaOH, NaCl, NaHPO₄, boric acid, etc. It is also very desirable to include antidandruff agents such as zinc pyridine-thiol N-oxide.

20 The choice of a proper thickener is complicated by the fact that the ingredients react with many anionic thickeners and many nonionic thickeners fail to thicken the compositions. Suitable thickening agents include carragenan, hydroxyethyl cellulose (e.g., one with a D.S. of about 2.5 whose 1% solution has a viscosity of 3-4,000 centipoises at 25°C.), and the compounds disclosed in U.S. Pat. No. 3,472,840, F. W. Stone and J. M. Rutherford, Jr., as set forth in the application of Roger Clarence Birkofe, Ser. No. 313,907, entitled "MILD THICKENED SHAMPOO COMPOSITIONS WITH CONDITIONING PROPERTIES," filed concurrently herewith, and now abandoned. These thickeners are desirable in that they tend to provide clear, single-phase compositions. All patents and applications referred to herein are specifically incorporated herein by reference. All percentages, ratios, and parts herein are by weight unless otherwise specified.

EXAMPLE I

Ingredient	% by Weight
3-(N,N-dimethyl-N-laurylaminoo)propane sulfonate (sultaine)	4.9
Sodium salt of sulfated polyethoxylated (3) coconut fatty alcohol (AE ₃ S)	6.6
Polyethoxylated (20) sorbitan mono-laurate (Tween 20)	14.0
Ethanol	7.0
Water	balance
	Adjusted to a pH of 7.0 with HCl.

EXAMPLE II

Ingredient	% by Weight
N-(3-coconutacylamidopropyl)-N,N-dimethyl-2-aminoacetate (amidobetaine)	5.0
AE ₃ S	7.2
Polyethoxylated (206 moles) polypropylene glycol, molecular weight 10,800. (PPG)	14.0

-continued

Ingredient	% by Weight
Water Adjusted to pH of 7.0 with HCl.	balance

EXAMPLE III

-continued

Ingredient	% by Weight
(D.P. - 2.5) having a viscosity at 1% in water at 25°C. of 3-4,000 centipoises]	5
Ethanol	7.0

Water Adjusted to pH of 7.0 with NaH ₂ BO ₃ .	balance
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Ingredient	% by Weight
Amido Betaine	4.0
Sodium polyethoxylated(3)lauryl sulfosuccinate monoester (Ethoxylated sulfosuccinate)	8.2
PPG	14.0
Ethanol	7.0
NaH ₂ PO ₄ ·H ₂ O	1.0
Water pH adjusted to 7.0 with NaOH.	balance

EXAMPLE IV

EXAMPLE VII

Ingredient	% by Weight
3-(N-laurylmorpholino)-2-hydroxypropane-sulfonate	15 4.0
Sodium nonylphenol polyethoxy(6)ether sulfate	7.0
Polyethoxylated(25) undecylphenol	16.0
Natrosol 250 HH	1.8
Ethanol	6.0
Water Adjusted to pH 7.0 with NaOH.	balance

Ingredient	% by Weight
Sultaine	4.5
AE ₉ S	7.0
Polyethoxylated(20)tridecyl alcohol (β -methyl dodecanol) (PTA)	14.0
Ethanol	7.0
Cationic thickener -2 [cationic cellulose ether of Claim 7 of U.S. Pat. No. 3,472,840, wherein a is 2, b is 2, q is 0, m + p is about 1.5, the degree of substitution of the cationic group (and m) are about 0.2, and the viscosity of a 1% aqueous solution is 125-1500 centipoises at 25°C.]	1.25
Water pH adjusted to 7.0 with HCl.	balance

EXAMPLE V

EXAMPLE VIII

Ingredient	% by Weight
3-[N-undecyl-N-ethyl-N-(2-hydroxyethyl)ammonio]-butyrate	4.5
Potassium polyethoxylated(3)tridecanoether sulfate	6.6
Polyethoxylated(30) sorbitan monococonutacylate	17.0
Ethanol	6.0
Cationic thickener, -1 (same as thickener of Example IV except having a D.S. of the cationic group of 0.4)	1.0
Water Adjust pH to 7.0 with HCl.	balance

Ingredient	% by Weight
Amido Betaine	4.0
Ethoxylated sulfosuccinate	8.2
PTA	14.0
Ethanol	7.0
Water pH adjusted to 7.0 with NaOH.	balance

EXAMPLE VI

EXAMPLE IX

Ingredient	Concentrated Shampoo	% by Weight
3-(N,N-dimethyl-N-coconutalkylammonio)-2-hydroxypropane sulfonate		10.0
Ethoxylated amidosulfate		15.0
Tween 20		30.0
Natrosol 250 HH		2.0
Ethanol		5.0
Water pH adjusted to 7.0 with NaOH.		balance

Ingredient	% by Weight
N-(3-coconutacylamidopropyl)-N,N-di(2-hydroxyethyl)-3-aminopropane-sulfonate	5.0
Sodium salt of sulfated polyethoxylated(4)lauroylamide (ethoxylated amido sulfate)	8.0
Tween 20	13.0
Natrosol 250 HH [A hydroxyethyl cellulose	1.5

EXAMPLE X

Ingredient	% by Weight
Amido betaine	4.00
Ethoxylated sulfosuccinate	9.00

Ingredient	-continued	% by Weight	
PTA		12.00	
Na carageenan		1.00	5
2-bromo-2-nitro-1,3-propanediol (a bactericide)		.02	
Distilled water Adjusted pH to 7.0 with NaOH.		balance	10

EXAMPLE XI

Ingredient	% by Weight	15
C-cetyl betaine	5.00	
AE ₃ S	8.00	
Polyethyleneglycol(20)monolaurate	14.00	20
Distilled water Adjusted pH to 7.0 with HCl.	balance	

EXAMPLE XII

Ingredient	% by Weight	
Sultaine	4.00	
AE ₃ S	5.50	30
PPG (molecular weight 3,000)	14.00	
Cationic thickener	.60	
Ethanol	7.00	35
Perfume	0.25	
Distilled water Adjusted pH to 7.0 with HCl.	balance	

EXAMPLE XIII

Ingredient	% by Weight	
Amido betaine	3.00	45
Ethoxylated sulfosuccinate	7.00	
Tween 20	14.00	
Cationic thickener, -2	0.50	50
Ethanol	7.00	
Distilled water Adjusted pH to 7.0 with NaOH.	balance	

When in the above Examples I-XIII the following zwitterionic surfactants, either totally or in part (e.g., a 1:1 ratio), substantially equivalent results are obtained in that the shampoos are exceptionally mild to the eyes.

1. 4-[N-coconutacylamidopropylene-N,N-di(2-hydroxypropyl)-ammonio]butane-1-sulfonate;
2. 2[N-pentadecylamidopropylene-N-(3-hydroxypropyl)-N-propylammonio]ethane-1-sulfonate;
3. 4(N-laurylmorpholino)2-hydroxybutanoate;
4. 3-(N-laurylmorpholino)propane-1-sulfonate;
5. 3-(N-tridecyl-N-methyl-N-propyl)-aminopropanoate;
6. 4-(N,N,N-trimethylammonio)stearate;

7. 3-[N-Methyl-N-(2-hydroxyethyl)-N-propylammonio]eicosane-1-sulfonate;
8. 5-[N,N-(3-hydroxypropyl)-N-methylammonio]-3-hydroxydocosane-1-carboxylate;
9. N-coconutalkyl betaine;
10. C-cetyl betaine;
11. C-hexadecyl betaine;
12. 3-(N,N-dimethyl-N-coconutalkylammonio)-2-hydroxypropane-1-sulfonate;
13. 6-coconutacylamido-3-trimethylammoniohexanoate;
14. 7-coconutacylamido-4-tri(2-hydroxyethyl-heptane-1-sulfonate;
15. 3-[N-(3-coconutacylamidopropyl)-N,N-dimethylammonio]-propane-1-sulfonate;
16. 3-[N-(3-coconutacylamidopropyl)-N,N-di(2-hydroxyethyl)-ammonio]-2-hydroxypropane-1-sulfonate;
17. 6-(N-coconutalkyl-N,N-dimethyl)hexanoate;
18. 5-(N,N-dipropyl-N-dodecylammonio)pentane-1-sulfonate;
19. 3-(N-methylmorpholino)stearate.

When in the above Examples I-XIII, the following ethoxylated anionic surfactants are substituted for the specifically named ethoxylated anionic surfactants, either totally or in part (e.g., a 1:1 ratio), substantially equivalent results are obtained in that the shampoos are exceptionally mild to the eyes:

1. Ammonium polyethoxylated(10)octanol ether sulfate;
2. Triethanolammonium polyethoxylated(2)2-ethyltetradecanol sulfate;
3. Potassium polyethoxylated(4) octylphenol ether sulfate;
4. Sodium polyethoxylated(6)pentadecylphenol ether sulfate;
5. Diethanolammonium polyethoxylated(4)dodecane-2-ol ether sulfate;
6. Monoethanolammonium polyethoxylated(5)tetrapropylene phenol ether sulfate;
7. Sodium polyethoxylated(8)3-nonylphenol ether sulfate;
8. Potassium polyethoxylated(4)octoylamine ether sulfate;
9. Triethanolammonium polyethoxylated(5)hexadecylamide ether sulfate;
10. Potassium polyethoxylated(2)octanol sulfosuccinate monoester;
11. Triethanolammonium polyethoxylated(10)hexadecanol sulfosuccinate monoester.

When in the above Examples I-XIII, the following ethoxylated nonionic surfactants are substituted for the specifically named ethoxylated nonionic surfactants, either totally, or in part (e.g., a 1:1 ratio), substantially equivalent results are obtained in that the shampoos are exceptionally mild to the eyes:

1. Polyethoxylated(40)octanol;
2. Polyethoxylated(10)hexadecanol;
3. Polyethoxylated(25)2-ethylnonanol;
4. Polyethoxylated(18)dodecane-2-ol;
5. Polyethoxylated(35)hexylphenol;
6. Polyethoxylated(30)pentadecylphenol;
7. Polyethoxylated(40)tetrapropylenephenol;
8. Polyethoxylated(25)3-nonylphenol;
9. Polyethoxylated(35)sorbitan monostearate;
10. Polyethoxylated(25)sorbitan monoctanoate;
11. Polyethoxylated(25)polypropylene glycol (M.W. 1000);

12. Polyethoxylated(25)octanoate;
 13. Polyethoxylated(30)hexadecanoate;
 14. Polyethoxylated(300)polypropylene glycol (M.W. 15,000).

What is claimed is:

1. A mild shampoo composition comprising surfactants and water, said surfactants consisting of a mixture of:

A. a polyethoxylated anionic surfactant selected from the group consisting of (1) a surfactant having the formula $R(OC_2H_4)_nOSO_3M$, wherein R is a hydrophobic group selected from the group consisting of alkyl groups containing from about 8 to about 16 carbon atoms, alkylphenyl groups wherein the alkyl group contains from about 6 to about 15 carbon atoms, and fatty acid amido groups wherein the fatty acid contains from about 8 to about 16 carbon atoms, wherein n is a number from about 1 to about 10 and M is a non-toxic cation which makes the surfactant water-soluble, and (2) a water-soluble polyethoxylated fatty alcohol sulfosuccinate monoester wherein said fatty alcohol contains from about 8 to about 16 carbon atoms and said polyethoxylated fatty alcohol contains from about 1 to about 10 ethoxy moieties per molecule; (B) a zwitterionic surfactant having the formula $(R^2)_4N^{(+)}(R^3)_{3-4}CH_2-B(R^2)_B(R^4)_cY^{(-)}$, wherein A, B, and C are each selected from the group consisting of 0 and 1, wherein A is 0 when B is 1 and A is 1 when B is 0, wherein C can only be 1 when Y is a sulfonate group, wherein each R^2 is selected from the group consisting of alkyl groups containing from about 8 to about 16 carbon atoms, and a moiety having the formula $R^5-C(O)NH-R^6$ - wherein R^5 is an alkyl group containing from about 8 to about 16 carbon atoms and R^6 is an alkylene group containing from 1 to about 5 carbon atoms, wherein each R^3 is selected from the group consisting of alkyl, hydroxyalkyl and alkoxyalkyl groups which can be connected to form a ring and each of which contains from 1 to about 3 carbon atoms, wherein Y is selected from the group consisting of sulfonate and carboxylate groups, and wherein R^4 is an alkylene group containing from 1 to about 5 carbon atoms when Y is a carboxylate group and R^4 is selected from the group consisting of alkylene and hydroxyalkylene groups containing from 2 to about 5 carbon atoms when Y is a sulfonate group, and wherein the hydroxy group in said hydroxyalkylene groups is on a secondary carbon atom;

C. a polyethoxylated nonionic surfactant selected from the group consisting of: (1) polyethoxylated alkyl alcohols, said alkyl alcohols containing an alkyl group containing from about 8 to about 16 carbon atoms and said polyethoxylated alkyl alcohols containing from about 10 to about 45 ethoxy moieties per molecule, (2) polyethoxylated alkylphenols wherein the alkyl group contains from about 6 to about 15 carbon atoms and wherein the polyethoxylated alkylphenol contains from about 10 to about 45 ethoxy moieties per molecule, (3) polyethoxylated mono fatty acid esters of sorbitol wherein said fatty acids contain from about 8 to about 18 carbon atoms and said polyethoxylated mono fatty acid ester of sorbitol contains from about 10 to about 45 ethoxy moieties per molecule, (4) polyethoxylated polypropylene glycol, said

polypropylene glycol having a molecular weight of from about 1000 to about 15,000 and said polyethoxylated polypropylene glycol containing from about 15 to about 300 ethoxy moieties per molecule, and (5) polyethoxylated fatty acids wherein said fatty acid contains from about 8 to about 16 carbon atoms and said polyethoxylated fatty acid contains from about 10 to about 45 ethoxy moieties per molecule, the molecular ratio of (A) to (B) being from about 1:1 to about 4:1; the weight ratio of (A) + (B) to (C) being from about 2:1 to about 1:2; and the pH of the composition being from about 6.0 to about 8.0.

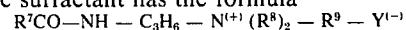
2. The composition of claim 1 wherein the anionic surfactant is present in an amount of from about 2% to about 15% by weight of the composition.

3. The composition of claim 2 wherein the molecular ratio of the anionic surfactant to the zwitterionic surfactant is from about 1:1 to about 3:1.

4. The composition of claim 2 wherein the molecular ratio of the anionic surfactant to the zwitterionic surfactant is from about 1:1 to about 2:1.

5. The composition of claim 1 having a pH of about 7.0.

6. The composition of claim 1 wherein the zwitterionic surfactant has the formula

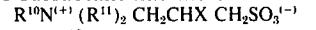


wherein R^7 is an alkyl group containing from about 9 to about 15 carbon atoms, wherein each R^8 is selected from the group consisting of methyl, ethyl, and 2-hydroxyethyl groups, wherein Y is selected from the group consisting of sulfonate and carboxylate groups, and wherein R^9 is a methylene group when Y is a carboxylate group and is selected from the group consisting of propylene and 2-hydroxypropylene groups when Y is a sulfonate group.

7. The composition of claim 6 wherein Y is a carboxylate group.

8. The composition of claim 6 wherein Y is a sulfonate group.

9. The composition of claim 1 wherein the zwitterionic surfactant has the formula



wherein R^{10} contains from about 10 to about 16 carbon atoms, wherein each R^{11} is selected from the group consisting of methyl, ethyl, and 2-hydroxyethyl groups, and wherein X is selected from the group consisting of hydrogen and hydroxyl groups.

10. The composition of claim 1 wherein the anionic surfactant is a sodium salt of a fatty alcohol polyethoxy ether sulfate containing a fatty alkyl group containing from about 10 to about 14 carbon atoms and about 3 ethoxy moieties per molecule.

11. The composition of claim 1 wherein R is a fatty acid amido group containing from about 10 to about 14 carbon atoms and n is about 3.

12. The composition of claim 1 wherein the nonionic surfactant is a polyethoxylated mono fatty acid ester of sorbitol wherein the fatty acid contains from about 10 to about 16 carbon atoms and wherein there are from about 15 to about 40 ethoxy moieties per molecule.

13. The composition of claim 12 wherein the fatty acid is lauric acid.

14. The composition of claim 1 wherein the nonionic surfactant is a polyethoxylated alkyl alcohol wherein said alkyl alcohol contains from about 10 to about 14 carbon atoms and wherein there are from

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about 15 to about 40 ethoxy moieties per molecule.

15. The composition of claim 1 wherein the nonionic surfactant is a polyethoxylated polypropylene glycol wherein said polypropylene glycol has a molecular weight of from about 8,000 to about 12,000 and said polyethoxylated polypropylene glycol contains from about 20 to about 100 ethoxy moieties per molecule.

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16. The composition of claim 1 wherein the anionic surfactant is a sodium salt of a polyethoxylated fatty alcohol sulfosuccinate monoester, wherein said fatty alcohol contains from about 10 to about 14 carbon atoms and said polyethoxylated fatty alcohol contains about 3 ethoxy moieties per molecule.

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