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(54) Titre : COMPOSITIONS NETTOYANTES LIQUIDES  
(54) Title: LIQUID CLEANSING COMPOSITIONS

(57) **Abrégé/Abstract:**

Novel cleansing compositions and methods for making same are described. Preferred embodiments provide compositions comprising an acrylate copolymer, an alkoxylated methyl glucoside polyol, and a surfactant. Preferred alkoxylated methyl glucoside polyols among those useful herein may include ethoxylated and/or propoxylated methyl glucoside polyols.



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**Abstract:**

Novel cleansing compositions and methods for making same are described. Preferred embodiments provide compositions comprising an acrylate copolymer, an alkoxyated methyl glucoside polyol, and a surfactant. Preferred alkoxyated methyl  
5 glucoside polyols among those useful herein may include ethoxyated and/or propoxyated methyl glucoside polyols.

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## LIQUID CLEANSING COMPOSITIONS

This application is a divisional of Canadian Patent Application No. 2,574,030, filed July 20, 2005.

It will be understood that any reference to the “present invention” or the like  
5 may encompass the subject-matter of this divisional application and/or its parent.

### Background of the Invention

While cleansing compositions comprising various surfactants and structuring agents, such as, for example, acrylate copolymers, have been described (e.g., U.S. Patent No. 6,635,702 B1, U.S. Patent No. 6,642,198), it has been found that the use of anionic and  
10 amphoteric surfactants in combination with acrylate copolymers do not always provide desired characteristics, such as sufficient foam. Acrylate copolymer in cleansing systems can inhibit foaming with use of typical surfactants, such as sodium laureth sulfate and cocamidopropyl betaine.

### Brief Summary of the Invention

15 The present invention is directed, in part, to novel cleansing compositions and methods for making same. Specifically, in certain embodiments, there are provided compositions comprising an acrylate copolymer, an alkoxyated methyl glucoside polyol, and a surfactant. Another embodiment of the invention relates to methods for making cleansing compositions.

20 In one particular embodiment, the invention relates to a cleansing composition comprising: (a) an anionic surfactant; (b) an amphoteric surfactant; (c) an acrylate copolymer; (d) an alkoxyated methyl glucoside ether having an average degree of alkoxylation of 8 to 22 in an amount of 0.05 to 4 % by weight of the total cleansing composition; and (e) water.

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In a further particular embodiment, the invention relates to a cleansing composition comprising: a) 3% to 25% by weight of an anionic surfactant; b) 0.05% to 15% by weight of an amphoteric surfactant; c) 0.1% to 12% by weight of an acrylate copolymer; d) 0.05% to 4% by weight of an alkoxyated methyl glucoside ether having an average degree of alkoxylation of 8 to 22; and e) water.

### **Detailed Description of the Invention**

In certain embodiments, the invention is directed to cleansing compositions that are structured liquids that provide improved foaming, excellent skin feel, and/or good viscosity/rheological profiles for dispensing and the ability to suspend other additives. In certain embodiments, the compositions of the invention are non-emulsion liquid cleansing compositions.

In certain embodiments, the present invention is directed to cleansing compositions comprising at least one alkoxyated methyl glucoside polyol and at least one acrylate copolymer. Preferably, the methyl glucoside is alkoxyated with ethylene or propylene oxide.

According to one embodiment of the present invention, a composition is provided comprising an alkoxyated methyl glucoside polyol, an acrylate copolymer

and at least one surfactant. In certain embodiments of the invention, the surfactant comprises an anionic surfactant. In certain embodiments of the invention, the surfactant comprises an amphoteric surfactant. In certain embodiments of the invention, the composition comprises both an anionic surfactant and an amphoteric  
5 surfactant.

In certain embodiments of the invention, the anionic surfactant is preferably present in an amount of about 3% to about 25% by weight of the total composition, about 5% to about 18%, or about 7% to about 12% (all by weight of the total composition).

10 In certain embodiments of the invention, the amphoteric surfactant is preferably present in an amount of about 0.05% to about 15% by weight of the total composition, about 0.5% to about 10%, or about 1% to about 8% (all by weight of the total composition).

In certain embodiments of the invention, the acrylate copolymer is preferably  
15 present in an amount of about 0.1% to about 12% by weight of the total composition, about 0.5% to about 8%, or about 1% to about 5% (all by weight of the total composition).

In certain embodiments of the invention, the alkoxyated methyl glucoside polyol is preferably present in an amount of about 0.05% to about 6% by weight of the  
20 total composition, about 0.1% to about 4%, or about 0.2 to about 2% (all by weight of the total composition).

In certain embodiments, the alkoxyated methyl glucoside polyol is a methyl glucoside alkoxyated with ethylene or propylene oxide. In certain embodiments, mixtures of ethoxyated glucoside polyols and propoxyated glucoside polyols may be  
25 used. Preferably, the ethoxyated and/or propoxyated methyl glucoside is present in an amount of about 0.05% to about 6% by weight of the total composition, about 0.1% to about 4%, or about 0.2% to about 2% (all by weight of the total composition).

In certain embodiments, a basic neutralizing agent is preferably present in an amount of about 0.01% to about 5% by weight of the total composition, about 0.05% to  
30 about 4%, or about 0.1% to about 3% (all by weight of the total composition).

In certain embodiments, the composition of the invention additionally comprises water. The amount of water may vary, but may be up to about 99% by

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weight of the total composition, for example, about 35% to about 97%, or about 50% to about 90% (all by weight of the total composition).

In certain embodiments, the composition may further comprise effective amounts of optional ingredients including, but not limited to: colorants, fragrances, antibacterials, preservatives, antioxidants, beads, mica, glitter, opacifying agents, and pearlizing agents. In certain embodiments, the beads may comprise fragrance, exfoliating ingredients and/or moisturizing ingredients.

According to one preferred embodiment of the invention, the composition comprises beads containing shea butter. Preferably, the beads have a diameter in the range of about 100 to about 1200 microns.

In certain embodiments, the preferred pH of the composition is at least about 5.5, for example, about 6.0 to about 7.5, or about 6.4 to about 7.2.

Alkoxylated methyl glucoside polyols suitable for use in this invention include, without limitation, those having an average degree of alkoxylation of about 8 to about 22. Suitable alkoxylated methyl glucoside polyols include, but are not limited to, ethoxylated and propoxylated methyl glucosides. Examples include, but are not limited to, methyl gluceth-10, methyl gluceth-20, PPG-10 methyl glucose ether, and PPG-20 methyl glucose ether.

Examples of suitable anionic surfactants include, but are not limited to, alkyl sulfates, ethoxylated alkyl sulfates, alkyl sulfonates, alkyl olefin sulfonates, alkyl succinates, alkyl sulfosuccinates, alkyl ethoxy sulfosuccinates, acyl and alkyl glutamates, alkyl phosphates, alkyl ether carboxylates, alkyl isethionates, and acyl amides.

Suitable amphoteric surfactants may include, but are not limited to, betaine surfactants. Examples of suitable amphoteric surfactants include, but are not limited to, alkyl betaines, alkylamido betaines, alkyl sulfobetaines, alkyl sultaines and alkylamido sultaines. Preferably, the alkyl and acyl groups generally contain from about 8 to about 18 carbons.

Suitable acrylate copolymers include, without limitation, those described in U.S. Patent Number 6,635,702 B1 and those selected from the group consisting of:

- (a) monomers or copolymers of one or more of methacrylic acid, acrylic acid, itaconic acid, esters of any of the foregoing and mixtures of any of the foregoing;
- (b) a member of group (a) copolymerized with one or more members selected from the group consisting of Steareth-20, Steareth-50, Ceteth-20.

Examples of suitable acrylate copolymers include, without limitation, those sold under the trademarks CARBOPOL® AQUA SF-1 from Noveon (Cleveland, Ohio), SYNTHALEN® W2000 from 3V (Wehawkin, New Jersey), ACULYN® 22, and ACULYN® 33 available from International Specialty Products Corporation (Wayne, New Jersey).

Suitable alkaline neutralizing agents include, without limitation, inorganic and organic neutralizers selected from the group consisting of alkali hydroxides (such as ammonium, sodium, and potassium) and alkanolamines (such as triethanolamine, isopropanolamines), preferably, sodium hydroxide or triethanolamine.

In certain embodiments, compositions of the invention may optionally comprise opacifying and/or suspending agents including, but not limited to: glycol stearates and glycol distearates, including, without limitation, ethylene glycol distearate, ethylene glycol monostearate and polyethylene glycol distearate; coated micas, glitter and mixtures thereof.

Compositions according to the invention may be made using conventional mixing techniques known to those skilled in the art for mixing ingredients.

#### EXAMPLES

The invention is further demonstrated in the following examples. The examples are for purposes of illustration and are not intended to limit the scope of the present invention. In the Examples, as elsewhere in this application, values for n, m, etc. in formulas, molecular weights and degree of ethoxylation or propoxylation are averages. Temperatures are in degrees C unless otherwise indicated. The amounts of the components may be in weight percents based on the standard described; if no other standard is described then the total weight of the composition is to be inferred (active basis). Various names of chemical components include those listed in the CTFA International Cosmetic Ingredient Dictionary (Cosmetics, Toiletry and Fragrance Association, Inc., 7<sup>th</sup> ed. 1997).

#### General Method of Making Compositions

Using the types and amounts of ingredients listed in the examples, the products are prepared at ambient temperature (approximately 20 -25 degrees C) by adding the DMDM Hydantoin to the water in a vessel equipped with center turbine agitation. The acrylate copolymer is then added to the water phase and mixed. The sodium laureth sulfate is added to the mixture and then neutralized with sodium hydroxide to a pH

- range of 6.5 – 7.5 at 25°C. Cocamidopropyl betaine is then added and mixed. The other ingredients are added in order and mixed until uniform. The citric acid is added to adjust the pH to approximately 6.4 – 7.2. The sodium chloride is added to adjust the viscosity to approximately 4300 centipoise (cps), wherein the formulation viscosity is
- 5 in the range of 2500 - 5500 cps as measured by a Brookfield DV II+ Viscometer using Spindle # 5 at 20 RPM at 25°C.

### Example 1

#### Pearlized Liquid Hand Soap with Glucams

10

Table 1

INCI Name	Tradename	% (weight/weight)	% (weight/weight on an active basis)
Water	Water	44.10	83.12
DMDM Hydantoin	GLYDANT PLUS®	0.40	0.24
Acrylate Copolymer (30%)	CARBOPOL® AQUA SF-1	8.50	2.55
Sodium Laureth Sulfate (25.5%)	STANDAPOL® ES-2	35.22	8.98
Sodium Hydroxide (50%)	Sodium Hydroxide	0.70	0.35
Cocamidopropyl Betaine (30%)	EMPIGEN® BS/CQ	5.35	1.61
Tetrasodium EDTA (39%)	DISSOLVINE® E-39	0.08	0.03
Methyl Gluceth-10	GLUCAM™ E-10	0.50	0.50
PPG-10 Methyl Glucose Ether	GLUCAM™ P-10	0.30	0.30
Glycol Distearate	EUPERLAN® PK 3000 AM	2.00	1.04
Butyrospermum Parkii (Shea Butter), Gelatin, Acacia Senegal Gum, Iron Oxide	HC-1741 Beads	0.50	0.50
Fragrance	Skin Balm	0.35	0.35
Citric Acid (50% solution)	Citric Acid	0.10	0.05
Sodium Chloride (25% solution)	Sodium Chloride	1.50	0.38
Total weight		100.00	100.00

### Example 2

#### Pearlized Liquid Hand Soap without Glucams



Table 2

INCI Name	Tradename	% (Weight/weight)	% (Weight/weight on an active basis)
Water	Water	44.90	83.92
DMDM Hydantoin	GLYDANT PLUS®	0.40	0.24
Acrylate Copolymer (30%)	CARBOPOL® AQUA SF-1	8.50	2.55
Sodium Laureth Sulfate (25.5%)	STANDAPOL® ES-2	35.22	8.98
Sodium Hydroxide (50%)	Sodium Hydroxide	0.70	0.35
Cocamidopropyl Betaine (30%)	EMPIGEN® BS/CQ	5.35	1.61
Tetrasodium EDTA (39%)	DISSOLVINE® E-39	0.08	0.03
Methyl Gluceth-10	GLUCAM™ E-10	0.00	0.00
PPG-10 Methyl Glucose Ether	GLUCAM™ P-10	0.00	0.00
Glycol Distearate	EUPERLAN® PK 3000 AM	2.00	1.04
Butyrospermum Parkii (Shea Butter), Gelatin, Acacia Senegal Gum, Iron Oxide	HC-1741 Beads	0.50	0.50
Fragrance	Skin Balm	0.35	0.35
Citric Acid (50% solution)	Citric Acid	0.10	0.05
Sodium Chloride (25% solution)	Sodium Chloride	1.50	0.38
Total weight		100.00	100.00

5

Example 3Clear Antibacterial Liquid Hand Soap

Table 3

INCI Name	Tradename	% (Weight/weight)	% (Weight/weight on an active basis)
Water	Water	44.18	83.00
DMDM Hydantoin	GLYDANT PLUS®	0.42	0.25
Acrylate Copolymer (30%)	CARBOPOL® AQUA SF-1	8.74	2.62
Sodium Laureth Sulfate	STANDAPOL® ES-	36.25	9.24

(25.5%)	2		
Sodium Hydroxide (50%)	Sodium Hydroxide	0.72	0.36
Cocamidopropyl Betaine (30%)	EMPIGEN® BS/CQ	5.51	1.65
Tetrasodium EDTA (39%)	DISSOLVINE® E-39	0.21	0.08
Methyl Gluceth-10	GLUCAM™ E-10	0.50	0.50
PPG-10 Methyl Glucose Ether	GLUCAM™ P-10	0.50	0.50
Butyrospermum Parkii (Shea Butter), Gelatin, Acacia Senegal Gum, Iron Oxide	HC-2329 Beads	0.50	0.50
Triclosan	IRGASAN® DP300	0.12	0.12
Fragrance	Cosmolem	0.35	0.35
FD&C Colors	Color	0.40	0.40
Citric Acid (50% solution)	Citric Acid	0.10	0.05
Sodium Chloride (25% solution)	Sodium Chloride	1.50	0.38
Total weight		100.00	100.00

#### Example 4

##### Rheology Testing

5 Rheology of cleansing liquids is key to a consumer's perception of consistency and dispensing. Consumers perform flow experiments when they use the product. How a product flows in a bottle and is dispensed, how the product is pumped and dispensed and how the product is spread out in use to generate lather are all examples of a shear force being applied.

10 A series of rheological measurements including strain sweep and creep tests were conducted. All rheological measurements were conducted using a Paar Physica MCR300 Rheometer equipped with a TEK 150 P-CF peltier plate, a 50 mm parallel plate (PP50) and a 1 millimeter gap at 23°C.

15 Strain sweeps are used to define the linear viscoelastic (LVE) region and determine the magnitude of  $G'$  (elastic modulus) and  $G''$  (viscous modulus) of an intact substance and is expressed as  $\tan(\delta)$  which equals  $G''$  over  $G'$ . If  $\tan(\delta)$  is greater than 1.0, the substance is viscous dominant and if  $\tan(\delta)$  is smaller than 1.0, the substance is elastic dominant. Creep tests determine the relative contribution of the elastic and viscous elements.

Table 4: Key Rheological Parameter Results

Rheology Parameter	Pearlized Liquid Hand Soap with Glucams Example 1	Pearlized Liquid Hand Soap without Glucams Example 2
Elastic Portion, %	45.3	23.3
G' within LVE	77.0	83.1
G'' within LVE	29.6	38.0
Tan (delta), G''/G'	0.38	0.46
Yield Value (Pa)	3.6	4.2

- 5 The rheological measurements indicate that the Liquid Hand Soap with the Glucams has a higher elastic portion, a lower tan (delta) and a lower G''. The greater the value of G'' or tan (delta) the stringier the product, which is consistent with sensory evaluations and not as desirable.

#### Example 5

#### 10 Sensory Panel – Hand Wash Dispensing Study

For evaluating aesthetic properties, a composition of Example 1 was compared on the basis of aesthetics for foaming and dispensing from a liquid hand soap container to the composition of Example 2.

#### 15 Methodology:

##### Products:

- Pearlized Liquid Hand Soap with Glucams (control) Example 1
- 20 • Pearlized Liquid Hand Soap without Glucams Example 2

##### Procedure:

Two products were tested in two phases: a sequential monadic hand wash phase and a side-by-side dispensing phase.

25

Part 1- Hand Wash Evaluation: Each panelist washed with each product over 2 test sessions. Panelists dispensed the product using their normal habits, then washed their hands with the product (in water temperature about 37°C +/-1°C) and evaluated the product. Each panelist evaluated all products in a balanced/randomized order of

presentation. Panelists answered a series of questions related to the dispensing and hand washing properties of the product.

5 Part 2- Dispensing Evaluation: Upon completing the hand wash portion of the study, panelists evaluated the dispensing properties of the 2 products (randomized presentation). Panelists pumped each product twice into a dish to evaluate the dispensing properties. Panelists were instructed to pump as they would normally pump, wait for the pump to recover (count to 10) and then pump the product again. This procedure was repeated with each product. Panelists answered a series of  
10 questions related to the dispensing properties in between each product.

Subjects:

79 liquid hand soap users participated in the study.

15 Results of Comparison of Pearlized Liquid Hand Soap with glucams versus without glucams

Part I: Hand wash and dispensing (see Table 6)

- 20 • *Pearlized Liquid Hand Soap without Glucams* was rated as having less lather compared to the *Pearlized Liquid Hand Soap with Glucams*.

Part II: Dispensing only (see Table 5)

- 25 • The *Pearlized Liquid Hand Soap without Glucams* was rated as being more stringy as it was dispensed compared to the *Pearlized Liquid Hand Soap with Glucams*.

Table 5: Rate how stringy the product was as you dispensed it

Rating		Pearlized Liquid Hand Soap without Glucams N=78	Pearlized Liquid Hand Soap with Glucams N=79
Very Stringy		%	%
7		1.3	1.3
6		12.8	5.1
5		16.7	9.0
4		16.7	20.5
3		20.5	19.2
2		23.1	33.3
1		9.0	11.5
Not at all Stringy	Mean	3.5	3.0

30

Table 6: Rate the Amount of Lather generated while washing

Rating		Pearlized Liquid Hand Soap without Glucams N=78	Pearlized Liquid Hand Soap with Glucams N=79
A Lot of Lather		%	%
7		1.3	1.3
6		6.4	15.2
5		15.4	26.6
4		24.4	25.3
3		28.2	17.7
2		12.8	8.9
1		11.5	5.1
Very Little Lather	Mean	3.5	4.1

Example 6

5

Foam Evaluation Testing - Cylinder Shake Test

The foam characteristics of liquid hand soap products were evaluated using a mechanical cylinder shake method. The procedure uses hard water, synthetic sebum and a Gaum Foam Machine available from Gaum, Inc., Robbinsville, New Jersey.

10

Hard Water Preparation: In a 2000 milliliter volumetric flask combine 40 grams of magnesium chloride () and 45 grams of calcium chloride and fill volumetric to line with deionized water. This will produce 25,000 ppm water hardness. To prepare 250 ppm hard water, put 20 milliliters of 25,000 ppm hard water solution into a 2000 milliliter volumetric flask and fill to the line with deionized water.

15

Synthetic Sebum Preparation:

The Synthetic Sebum was prepared by melting together the following ingredients at about 71°C while stirring with a spatula.

20

	<u>% weight/weight</u>
Palmitic Acid	10.0
Stearic Acid	5.0
Coconut Oil	15.0
25 Paraffin	10.0
Spermaceti	15.0
Olive Oil	20.0
Squalene	5.00
Cholesterol	5.00
30 Oleic Acid	10.0

Linoleic Acid	$\frac{5.0}{100.0}$
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5  
10  
15  
20

Foam height testing was performed on the compositions in Examples 1 and 2 above. 15 grams of liquid hand soap were added to 84 grams of 250 ppm hard water and 1 gram of Synthetic Sebum. The hard water was prepared by mixing together 40 grams of  $MgCl_2 \cdot 6H_2O$  with 45 grams of  $CaCl_2 \cdot 2H_2O$  and diluting to 250 ppm. The test mixture was then heated with moderate agitation and slow heating to 40.5°C. This dispersion was then carefully poured into a 600 ml. graduated cylinder containing a plastic water-filled tube. The cylinder was then mounted onto the center of a Vertical Rotator Assembly and rotated at a constant speed of 30 rpm. The action of the circular mixing of the cylinder and the free falling action of the water-filled tube in the cylinder generated foam which could be measured as foam height using the gradations on the side of the cylinder. After 8 complete revolutions, the Flash Foam Height was measured and after an additional 12 complete revolutions (a total of 20 revolutions) the Maximum Foam Height was measured. At this time the Drainage Time was also measured. Drainage Time is defined as the time measured from the completion of the 20 revolutions to the time at which 100 mls. of apparent liquid has drained. Drainage Time is a measure of the wetness and stability of the foam.

Table 7

<b>Foam Evaluation Testing</b> 1 gram Sebum 15 grams Liquid Soap 84 grams 250 PPM Water At 40.5°C			
Product Code	Flash Foam (ml)	Maximum Foam (ml)	Drainage Time (Min.Sec.)
Pearlized Liquid Hand Soap without Glucams	325	400	5.77
Pearlized Liquid Hand Soap with Glucams	375	495	4.65

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The results of foam evaluation testing indicate that the Pearlized liquid hand soap with Glucams had more flash foam and maximum foam height. The drainage time took less time and represents a more stable foam.

- 5 All numerical ranges described herein include all combinations and subcombinations of ranges and specific integers encompassed therein.

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CLAIMS:

1. A cleansing composition comprising:
  - (a) an anionic surfactant;
  - (b) an amphoteric surfactant;
  - 5 (c) an acrylate copolymer;
  - (d) an alkoxyated methyl glucoside ether having an average degree of alkoxylation of 8 to 22 in an amount of 0.05 to 4 % by weight of the total cleansing composition; and
  - (e) water.
- 10 2. A cleansing composition comprising:
  - a) 3% to 25% by weight of an anionic surfactant;
  - b) 0.05% to 15% by weight of an amphoteric surfactant;
  - c) 0.1% to 12% by weight of an acrylate copolymer;
  - d) 0.05% to 4% by weight of an alkoxyated methyl glucoside ether having an
  - 15 average degree of alkoxylation of 8 to 22; and
  - e) water.
3. The cleansing composition of claim 1 or 2, wherein the alkoxyated methyl glucoside ether consists of ether groups.
4. The cleansing composition of claim 1 or 2, wherein the alkoxyated methyl
- 20 glucoside ether is present in an amount of 0.05% to 2% by weight of the total composition.