This invention relates to a liquid anionic organic synthetic detergent composition which gives good performance and which has a desirable maeceous appearance without the use of ingredients that affect stability or act as performance loads. The opacifying agent of this invention consists essentially of suspended crystals of an undissolved portion of an anionic organic synthetic detergent constituent and thus contributes to, rather than detracts from, the active detergent of the composition. For example, and transparent liquid synthetic detergents are common in the industry, but, from a consumer point of view, it has become desirable to develop an efficient opaque product which has the appearance of liquefied white or colored bar soap. Opacity in a liquid product increases its appeal to the purchaser who associates the opacity with his favorite bar soap, powdered soap, or hand lotion which he has been accustomed to over the years; a transparent or translucent product does not have this particular appeal.

Previous attempts to produce opacity in liquid soaps involved the use of inorganic solids or dispersible organic solids or liquids which did not contribute to the detergency and which, in most instances, acted as performance inhibitors and resulted in products which were unstable against phase separation. Thus there is a demand for a mild, high sudsing good cleansing, concentrated liquid detergent composition, a suitable alkyl glyceryl ether sulfate salt in the detergent solution at a temperature at which the said salt is substantially completely soluble and then cooling the solution to a temperature, preferably room temperature, at which the alkyl glyceryl ether sulfate salt is substantially insoluble. As the solution is cooled, the alkyl glyceryl ether sulfate salt precipitates in the form of fine crystals which remain suspended in the detergent solution and which cause the product to have an over-all pearly white opacity. An orientation of the precipitated crystals and a slight crystal growth often causes an opalescent sheen which enhances the opaque appearance. A suitable composition can also be made by reducing the alkyl glyceryl ether sulfate salt to very small particle form in a colloidal mill and then appropriately suspending such particles in the detergent solution at room temperature, for example.

The specific gravity of the alkyl glyceryl ether sulfate salts used as opacifiers in accordance with this invention is about 1.25, which is only slightly higher than the specific gravity of the detergent solutions (about 1.02 to 1.20). Thus, there is but little tendency toward the gravitational separation that is normally encountered in the use of conventional opacifying agents which present a greater specific gravity differential.

Although the opacifier is substantially insoluble in the concentrated detergent solution at room temperatures, it becomes dissolved when the detergent solution is diluted to the concentrations normally used in forming a washing solution. Thus, the opacifiers employed in the instant invention have the additional advantage of ultimately becoming available as cleansing agents to
contribute to the overall detergency characteristics of the product.

It will be readily understood that while the liquid detergent compositions of this invention contain from about 25% to about 85% water, they are diluted 200 or more fold when added to water to form the conventional washing solution. This dilution is sufficient to effect substantially complete solution of the suspended opacifiers of the detergent composition when the temperature of the washed water is within the temperature range normally employed, i.e., from about 90° F. to about 130° F. Thus, during use, the opacifier dissolves to become a part of the active detergent ingredient. Although complete solution of the alkyl glyceryl ether sulfonate opacifier is desirable for achieving maximum detergency benefit, it has been observed that any undissolved opacifier does not remain completely inert but rather enhances sudsing performance during the washing operation.

The substantially insoluble alkyl glyceryl ether sulfonates are those with alkyl chain lengths of about C₁₄ to about C₁₈. Alkyl glyceryl ether sulfonates with alkyl chain lengths of C₁₂ or less are too soluble to be used as opacifiers but are, of course, used extensively as the substantially complete dissolved primary detergent in the present compositions.

In order to obtain the opalescent sheen in the opague compositions of this invention it has been found that at least 2% by weight of alkyl glyceryl ether sulfonate having alkyl chains of C₁₆ or less must be present. This portion of the more soluble alkyl glyceryl ether sulfonate is necessary to cause a slight crystal growth and an orientation of the suspended, precipitated, opacifying crystals.

Single alkyl glyceryl ether sulfonates with an alkyl radical of 16 or 18 carbon atoms, for example, can be employed in this invention; but it is ordinarily more convenient and less expensive to use a mixture of such compounds in which the alkyl radicals are derived from readily available fatty alcohol mixtures. The higher alcohols derived from the reduction of tallow is a preferred source for the production of the opacifier used in the composition of the invention because they contain predominantly 16 and 18 carbon atoms. Another source is the higher molecular weight fraction from a fatty alcohol mixture derived from coconut oil or palm kernel oil. Such mixtures are commonly fractionated in the industry to produce a fraction consisting predominantly of C₁₂ and C₁₄ alcohols which have outstanding utility in the preparation of the more soluble synthetic detergents. A by-product of such fractionation is a mixture of alcohols commonly known as Stearol which is used in the preparation of the opacifier of this composition.

The alkyl glyceryl ether sulfonates which are suitable for the opacifier of the composition of this invention and the more soluble alkyl glyceryl ether sulfonates which can be used as an active synthetic detergent of the composition are produced in the same manner. The first step is the reaction of fatty alcohols with epichlorohydrin to produce alkyl chloroglycerylethers. To produce the opacifier, fatty alcohols with alkyl radicals of predominantly 16 or 18 carbon atoms are used; fatty alcohols with alkyl radicals chiefly of 12 or 14 carbon atoms are used in the preparation of the more readily water-soluble anionic synthetic detergents. The alkyl chloroglyceryl ethers of step one are then sulfonated to produce the final alkyl glyceryl ether sulfonates. Two sulfonation methods are commonly used. One method consists of reacting the alkyl chloroglyceryl ethers with sodium sulfite. The other method involves treating the alkyl chloroglyceryl ethers with a strong caustic soda solution which forms alkyl glycerylate eters in turn which are separated from the salt solution and treated with sodium sulfite and bisulfite to produce the sodium alkyl glyceryl ether sulfonate. To produce the potassium alkyl glyceryl ether sulfonate the corresponding potassium salts are used in the processes.

Many of the various synthetic sulfonate and sulfate detergents well known in the art are useful as the basic active cleaning agent in the practice of this invention. The following examples of suitable water soluble anionic synthetic detergents are given only for the purpose of illustrating the wide variety of types of detergent compounds useful in the practice of the invention and it will be appreciated that the scope of the invention is not thereby limited.

The basic anionic synthetic detergents referred to in this invention are the substantially completely water-soluble (at room temperature) alkali metal (to be interpreted as including ammonium) salts of organic sulfuric reaction products having in their molecular structure alkyl radicals having from about 8 to about 18 carbon atoms and radicals selected from the group consisting of sulfonic acid and sulfonic acid ester radicals. The alkali metal salts of the sulfuric reaction products which find greatest utility are those which have from 10 to 14 carbon atoms and predominantly 12 carbon atoms in the alkyl radical, but since other constituents of the detergent molecule can be varied to increase the degree of effectiveness of the composition, the alkyl radical can also be adjusted upwardly in such instances to as high as 18, for example. Important examples of the synthetics which may be used in the composition of the present invention are the sodium or potassium lauryl glyceryl ether sulfonates made by the processes described above; sodium or potassium alkyl benzene sulfonates especially those of the types described in U.S. Patents 2,220,099 and 2,477,383 in which the alkyl groups contain from about 9 to about 15 carbon atoms; sodium, potassium or ammonium alkyl sulfates, especially those derived by sulfation of higher alcohols produced by reduction of glycerides of coconut oil; sodium coconut oil fatty acid monoglyceride sulfates and sulfonates; sodium, potassium and ammonium salts of sulfuric acid esters of the reaction product of one mole of coconut oil fatty alcohol and about 3 moles of ethylene oxide or of one mole of tallow fatty alcohol and about 10 moles of ethylene oxide; alkali metal salts of alkyl ethylene oxide ether sulfates which have an average of one unit of ethylene oxide per molecule; the reaction product of fatty acids esterified with isethionic acid and neutralized with sodium hydroxide where, for example, the fatty acids are derived from coconut oil; alkali metal salts of fatty acid esters of a mixture of fatty acids, for example, are derived from coconut oil; and others known in the art, a number being specifically set forth in U.S. Patents 2,396,278, Lind; 2,486,921, Byerly; and 2,486,922, Strain.

The synthetic detergents preferred for use as the basic active cleaning agent in the compositions of this invention include the water soluble alkali metal salts, such as the sodium, potassium, or ammonium alkyl ethylene oxide ether sulfates which have an average of three ethylene oxide units per molecule, alkyl sulfates, alkyl glyceryl ether sulfonates and alkyl benzene sulfonates and mixtures thereof. The basic synthetic detergents can be present in the liquid composition of this invention in percentages of about 5% to 45% by weight although the preferred range is about 15% to 30%.

When sufficient alkyl glyceryl ether sulfonate opacifying agent is dissolved in a heated detergent mixture so that from 0.5% to about 10% by weight is insoluble at room temperature. 0.5% of opacifier is about the minimum amount permissible for a satisfactory opaque product; heating to about 95° F. dissolves the opacifier at such concentrations. The presence of about 3% of the insoluble opacifiers is preferred to retain a proper opacity up to about 110° F. Above this
temperature this amount of opacifier completely dissolves. The top limit of opacifier content is not critical and up to about 10% or more of the opacifier can be utilized in the practice of this invention although heating the liquid detergent composition at about 180° F and above is required to dissolve such amounts of opacifier. While other ingredients of the compositions of this invention often exert a slight solubilizing effect on the opacifier, it is merely necessary to add enough of the substantially insoluble alkyl glyceryl ether sulfonate so that at least about 0.5% exists as undissolved crystals at room temperature, generally averaging about 80° F.

When the amounts of opacifier and active synthetic detergents used in the practice of this invention result in a product that is thick or viscous when combined only with water, it is often desirable to thin the mixture with a suitable water soluble organic solvent. Ethanol, propanol, isopropanol, ethylene glycol and propylene glycol are useful in this respect and the amounts used are from about 0% to about 25% (ordinarily about 3%–20%) by weight of the composition. Up to about 5% sodium or potassium toluene or benzene sulfonate can also be used as a hydrotrope in conjunction with the above-mentioned solvents.

The use of water soluble organic solvents also increases the solubility of the active synthetic detergents in water, the solubility increasing in substantially direct proportion to the amount of solvent used. For example, the practical limit of the solubility of common active synthetic detergent salts in water alone is about 25%. However, up to about 45% of these detergent salts can be used in the liquid compositions of this invention when about 25% of any of the above-mentioned water soluble organic solvent is added.

Satisfactory viscosities for the liquid compositions of this invention are in the range of about 150 to about 3000 centipoises at room temperature. Preferred viscosities are in the range of about 200 to 800 centipoises at room temperature.

The suspended crystals of the alkyl glyceryl ether sulfonate in the composition of this invention have a high degree of stability against gravitational separation. Tendencies for the crystals to settle can be decreased, for example, by increasing the specific gravity of the solution or by dispersion of the opacifier in very fine crystalline form.

The specific gravity of the solution can be increased by the inclusion of sodium salts such as sodium chloride, sodium sulfate, sodium acetate or other compatible salts in the formulation. Thus the difference between the specific gravity of the mixture it should be heated to a temperature only high enough to dissolve all the opacifier, 120° F to 160° F is ordinarly sufficient.

C. Cooling by allowing the mixture to stand at room temperature is sufficient to produce a satisfactory opaque product although finer crystals result when the mixture is cooled in a heat exchanger, especially one provided with a mechanical agitator, such as a "Votator."

Examples of suds stabilizer additives which can be used in the preparation of the detergent compositions of this invention, but which are not necessary, are the mono- and diethanolamides of coconut fatty acids.

The following examples are given to illustrate the manner in which this invention may be practiced. Its scope is not limited to the ingredients named in the examples since it is apparent that some may be interchanged with each other or equivalents substituted. Likewise, its scope is not limited to the proportions shown in these examples since the proportions may be varied to modify the viscosity or activity of detergent concentration and to adjust for variations in properties of substituted equivalent ingredients. The main feature of the invention is the obtaining of a stable, pleasing appearing opacity in a liquid detergent with good cleaning and sudsing performance and controllable physical properties.

All parts are shown by weight.

Example I.—Three moles of ethylene oxides were reacted with one mole of a middle cut coconut fatty alcohol which contained about 65% dodecanol, the balance being essentially fatty alcohols with 14 to 16 carbons. The reaction product was sulfonated with chlorosulfonic acid and then neutralized with caustic soda. The resulting alkyl ethylene oxide ether sulfatate had a coverage of three units of ethylene oxide per molecule.

The same middle cut coconut alcohol was reacted with 15% excess epichlorohydrin. The chloroglyceryl ether thus formed was sulfonated with sodium sulfate, forming an alkyl glyceryl ether sodium sulfonate in the example provided with a mechanical agitator, such as a "Votator."

Examples of suds stabilizer additives which can be used in the preparation of the detergent compositions of this invention, but which are not necessary, are the mono- and diethanolamides of coconut fatty acids.

The following examples are given to illustrate the manner in which this invention may be practiced. Its scope is not limited to the ingredients named in the examples since it is apparent that some may be interchanged with each other or equivalents substituted. Likewise, its scope is not limited to the proportions shown in these examples since the proportions may be varied to modify the viscosity or activity of detergent concentration and to adjust for variations in properties of substituted equivalent ingredients. The main feature of the invention is the obtaining of a stable, pleasing appearing opacity in a liquid detergent with good cleaning and sudsing performance and controllable physical properties.

All parts are shown by weight.

Example I.—Three moles of ethylene oxides were reacted with one mole of a middle cut coconut fatty alcohol which contained about 65% dodecanol, the balance being essentially fatty alcohols with 14 to 16 carbons. The reaction product was sulfonated with chlorosulfonic acid and then neutralized with caustic soda. The resulting alkyl ethylene oxide ether sulfatate had a coverage of three units of ethylene oxide per molecule.

The same middle cut coconut alcohol was reacted with 15% excess epichlorohydrin. The chloroglyceryl ether thus formed was sulfonated with sodium sulfate, forming an alkyl glyceryl ether sodium sulfonate in the example provided with a mechanical agitator, such as a "Votator."

Examples of suds stabilizer additives which can be used in the preparation of the detergent compositions of this invention, but which are not necessary, are the mono- and diethanolamides of coconut fatty acids.

The following examples are given to illustrate the manner in which this invention may be practiced. Its scope is not limited to the ingredients named in the examples since it is apparent that some may be interchanged with each other or equivalents substituted. Likewise, its scope is not limited to the proportions shown in these examples since the proportions may be varied to modify the viscosity or activity of detergent concentration and to adjust for variations in properties of substituted equivalent ingredients. The main feature of the invention is the obtaining of a stable, pleasing appearing opacity in a liquid detergent with good cleaning and sudsing performance and controllable physical properties.

All parts are shown by weight.

Example I.—Three moles of ethylene oxides were reacted with one mole of a middle cut coconut fatty alcohol which contained about 65% dodecanol, the balance being essentially fatty alcohols with 14 to 16 carbons. The reaction product was sulfonated with chlorosulfonic acid and then neutralized with caustic soda. The resulting alkyl ethylene oxide ether sulfatate had a coverage of three units of ethylene oxide per molecule.

The same middle cut coconut alcohol was reacted with 15% excess epichlorohydrin. The chloroglyceryl ether thus formed was sulfonated with sodium sulfate, forming an alkyl glyceryl ether sodium sulfonate in the example provided with a mechanical agitator, such as a "Votator."

Examples of suds stabilizer additives which can be used in the preparation of the detergent compositions of this invention, but which are not necessary, are the mono- and diethanolamides of coconut fatty acids.

The following examples are given to illustrate the manner in which this invention may be practiced. Its scope is not limited to the ingredients named in the examples since it is apparent that some may be interchanged with each other or equivalents substituted. Likewise, its scope is not limited to the proportions shown in these examples since the proportions may be varied to modify the viscosity or activity of detergent concentration and to adjust for variations in properties of substituted equivalent ingredients. The main feature of the invention is the obtaining of a stable, pleasing appearing opacity in a liquid detergent with good cleaning and sudsing performance and controllable physical properties.

All parts are shown by weight.
containing about 65% C₁₂, 20% C₁₄ and 15% C₁₆ alcohols
4.92 parts propylene glycol
4.92 parts ethanol
2.95 parts sodium alkyl glyceryl ether sulfonate derived from a mixture of alcohols consisting essentially of C₁₂ and C₁₄ alcohols and derived as the high boiling cut in the fractionation of a mixture of coconut oil alcohols
10 parts of a mixture of sodium chloride and sodium sulfate
51.47 parts water to make 100 parts

This preparation was cooled in a Votator to room temperature, about 80° F, and had good detergent and sudsing properties as well as the desired opaque opalescent sheen.

Example III.—The following materials were dissolved in water at about 160° F. Sodium alkyl glyceryl ether sulfonate derived from tallow fatty alcohol was prepared as shown in Example I.

37 parts ammonium salt of the sulfated middle cut coconut alcohol containing 65% dodecaneol, the remainder consisting essentially of alcohols of 14 and 16 carbon atoms
12 parts monoethanolamide of coconut fatty acids
18 parts ethanol
6 parts sodium alkyl glyceryl ether sulfonate derived from tallow fatty alcohol as described in Example I
2 parts of a mixture of sodium chloride and sodium sulfate occurring in the synthetic detergents employed
25 parts water to make 100 parts

This preparation had excellent detergent and sudsing properties and the desired white opacity. If propanol is substituted for the ethanol, substantially equal results are obtained.

Example IV.—The following materials were dissolved in the water shown below at about 120° F. The sodium alkyl glyceryl ether sulfonate was prepared using fatty alcohols derived by the reduction of tallow and containing about 65% C₁₂, 33% C₁₄ and 2% C₁₆ alcohols.

18 parts sodium propylene benzene sulfonate, the polypropylene averaging about 12 carbons
13 parts diethanolamide of coconut fatty acids
19 parts ethanol
2.5 parts sodium tallow alkyl glyceryl ether sulfonate prepared as described in Example I
2.0 parts of a mixture of sodium chloride and sodium sulfate occurring in the synthetic detergents employed
45.5 parts water to make 100 parts

After being cooled by passage through a heat exchanger, this preparation was an excellent detergent for dishwashing and had a pleasing opaque appearance with a viscosity of about 400 centipoises. If isopropanol is substituted for the ethanol, substantially equal results are obtained.

Example V.—The following ingredients were added to the water shown below at about 120° F, and then cooled to form a white opaque rather viscous liquid which was pourable, performed excellently as a detergent and foaming agent. The alkyl glyceryl ether sulfonate was prepared from a mixture of fatty alcohols derived from the reduction of coconut oil and containing about 65% C₁₂, 25% C₁₄ and 10% C₁₆ alcohols.

15 parts potassium alkyl glyceryl ether sulfonate
10 parts ethylene glycol
73 parts water
2 parts potassium chloride occurring in the synthetic detergents employed

If two parts of potassium acetate or potassium sulfate are added to the composition in the above example, substantially equivalent results are obtained.

Example VI.—A composition of the following ingredients was prepared by first effecting substantially complete solution of the solid constituents in the liquid constituents at slightly elevated temperature about 125° F, and then cooling to room temperature, about 80° F, in a heat exchanger. An opaque product having an opalescent sheen and excellent detergent and sudsing properties resulted.

20 parts sodium alkyl ethylene oxide ether sulfate produced by reacting 3 moles of ethylene oxide with 1 mole of fatty alcohol containing about 65% C₁₂, 20% C₁₄ and 15% C₁₆ alkyl radicals then saponifying and neutralizing the reaction product.
4 parts sodium alkyl glyceryl ether sulfonate prepared using a mixture of fatty alcohols derived by the reduction of coconut oil and containing about 90% C₁₂, 5% C₁₄ and 5% C₁₆ alkyl radicals
3 parts sodium alkyl glyceryl ether sulfonate prepared as described in Example I using the fatty alcohol derived by the reduction of tallow
5 parts monoethanolamide of coconut fatty acids
2 parts sodium toluene sulfonate
7 parts ethanol
6 parts sodium acetate
6 parts sodium chloride
47 parts water

In this example the following amounts of ingredients in separate compositions can be substituted for equal amounts of the alkyl ethylene oxide ether sulfate with substantially the same results:
5 and 10 parts sodium polypropylene benzene sulfonate described in Example IV
5 and 10 parts sodium alkyl phenol ethylene oxide ether sulfate in which there was an average of 4 ethylene oxide units per molecule and in which the alkyl radical contained about 9 carbon atoms
10 and 20 parts potassium alkyl ethylene oxide ether sulfate produced by reacting one mole of ethylene oxide with one mole of the fatty alcohol mixture as described in this Example VI
5 and 10 parts coconut fatty acid ester of sodium isethionate produced commercially under the trade name "Igepon AC-78"
20 parts ammonium salt of the alkyl ethylene oxide ether sulfate prepared as described in this Example VI

Example VII.—A liquid detergent composition was prepared by dissolving the following ingredients in water:

20 parts sodium alkyl ethylene oxide ether sulfate described in Example I
3 parts monoethanolamide of coconut fatty acids
7 parts ethanol
1.5 parts of a mixture of sodium chloride and sodium sulfate occurring in the synthetic detergents employed
62 parts water

4 parts of sodium alkyl glyceryl ether sulfonate prepared from coconut oil fatty alcohol as described in Example VI and 2.5 parts of sodium alkyl glyceryl ether sulfonate prepared from tallow fatty alcohol as described in Example I was dispersed in the above composition in a colloidal mill at 60° F. An excellent opaque liquid dishwashing detergent resulted.

Example VIII.—An opaque, fairly viscous, liquid detergent composition was prepared by dissolving the following ingredients in the water shown at about 150° F and cooling the composition to room temperature.

10 parts sodium alkyl ethylene oxide ether sulfate described in Example I
10 parts sodium polypropylene benzene sulfonate described in Example IV
5 parts sodium alkyl glyceryl ether sulfonate described in Example I using tallow fatty alcohol
2 parts of a mixture of sodium chloride and sodium sulfate occurring in the synthetic detergents employed
73 parts water to make 100 parts

Small amounts of perfumes and fluorescent brightening
agents known in the art can be added to improve product appeal and performance. Since the nacreous opacity is the basic feature of the invention, dyes can be added to produce pastel shades which can greatly enhance the customer attraction to the product. If desired, sudsing depressing agents can be employed to yield products especially designed for uses where excessive foaming properties would interfere with the use of the product.

This invention results in a stable, efficient, light duty detergent with a highly desirable appearance. It is intended mainly for dishwashing and the washing of fine fabrics but can also be used as a hair shampoo and as a detergent for laundry and other general household requirements.

What is claimed is:

1. An opaque liquid detergent composition an aqueous vehicle containing in solution about 5% to about 25% by weight of a water soluble anionic nonsoap synthetic detergent salt and suspended therein about 0.5% to 10% by weight of a crystalline opacifying agent selected from the group consisting of sodium and potassium salts of an alkyl glyceryl ether sulfonate with alkyl radicals ranging in chain length from C12 to C16 and which is substantially insoluble in the composition at room temperature.

2. An opaque liquid detergent composition an aqueous vehicle containing in solution about 5% to 25% by weight of a water-soluble anionic synthetic detergent salt selected from the group consisting of anionic sulfonate and sulfonate synthetic detergents and mixtures thereof, and suspended therein at least about 0.5% to 10% by weight of a crystalline opacifying agent selected from the group consisting of sodium and potassium salts of an alkyl glyceryl ether sulfonate with alkyl radicals ranging in chain length from C14 to C18 and which is substantially insoluble in the composition at room temperature.

3. The detergent composition of claim 1 or 2 in which at least 25% of the water-soluble anionic synthetic detergent salts present, includes at least 2% by weight of an alkyl glyceryl ether sulfonate with an alkyl chain length not greater than C14, whereby an opaque opalescent sheen is obtained.

4. The detergent composition of claim 3 in which the amount of water-soluble anionic synthetic detergent salts present, includes at least 2% by weight of an alkyl glyceryl ether sulfonate with an alkyl chain length not greater than C14, whereby an opaque opalescent sheen is obtained.

5. The detergent composition in accordance with claim 3 in which the opacifying agent is a sodium alkyl glyceryl ether sulfonate in which the alkyl radicals are derived from a fatty alcohol derived by the reduction of tallow.

6. The detergent composition in accordance with claim 3 in which the water-soluble anionic synthetic detergent salt is selected from the group consisting of alkyl sulfate, alkyl benzene sulfonate, alkyl ethylene oxide ether sulfate, alkyl glyceryl ether sulfonate and mixtures thereof.

7. The detergent composition in accordance with claim 3 in which there is included as an additional ingredient from 2 to 15 percent by weight of a dissolved alkali metal salt selected from the group consisting of sodium and potassium chlorides, sulfates and acetates to increase the specific gravity of the liquid phase.

8. An opaque liquid detergent composition comprising essentially, in an aqueous vehicle, about 15% to 30% by weight of a water-soluble anionic synthetic detergent salt selected from the group consisting of alkyl sulfate, alkyl benzene sulfonate, alkyl ethylene oxide ether sulfates, alkyl glyceryl ether sulfonates and mixtures thereof, about 0.5% to 10% by weight, of an opacifying agent, of a suspension of a sodium salt of an alkyl glyceryl ether sulfonate in which the alkyl radicals are derived from a fatty alcohol derived by the reduction of tallow, at least 2% by weight of a sodium salt of an alkyl glyceryl ether sulfonate in which the alkyl radicals are derived from a mixture of coconut oil fatty alcohols, about 3% to 20% by weight of a water-soluble organic solvent selected from the group consisting of ethanol, propanol, isopropanol, ethylene glycol, propylene glycol and mixtures thereof, and about 2% to 15% of a dissolved electrolyte salt selected from the group consisting of sodium chloride, sodium sulfate, sodium acetate and mixtures thereof.

9. The process of preparing opaque liquid detergent compositions which comprises heating a mixture of water, about 5% to 45% by weight of a water-soluble anionic synthetic detergent salts selected from the group consisting of anionic sulfonate and sulfonate synthetic detergents and mixtures thereof, and suspended therein about 0.5% to 10% by weight of a crystalline opacifying agent selected from the group consisting of sodium and potassium salts of an alkyl glyceryl ether sulfonate with alkyl radicals ranging in chain length from C12 to C18 and which is substantially insoluble in the composition at room temperature.

10. In the process of claim 9 the step of developing a slight growth and orientation of the suspended crystals of opacifying agent whereby an opalescent sheen is obtained by including as a portion of said detergent salts at least 2% by weight of an alkyl glyceryl ether sulfonate with an alkyl chain length of not greater than C14.

11. In the process of claim 9 the step of increasing the specific gravity of said solution by dissolving in said mixture from about 2% to 15% by weight of an electrolyte salt selected from the group consisting of sodium chloride, sodium sulfate, sodium acetate and mixtures thereof.

12. In the process of claim 10 the step of increasing the specific gravity of said solution by dissolving in said mixture from about 2% to 15% by weight of an electrolyte salt selected from the group consisting of sodium chloride, sodium sulfate, sodium acetate and mixtures thereof.

References Cited in the file of this patent

UNITED STATES PATENTS

2,094,489 Hueter Sept. 28, 1937
2,527,077 Preston Oct. 24, 1950
2,607,740 Vitale et al. Aug. 19, 1952
2,674,580 Henkin Apr. 6, 1954
2,770,599 Henkin Nov. 13, 1956

OTHER REFERENCES

"Soap and Sanitary Chemicals"; January 1951, pages 38-41, 115 and 117; article by Lesser.