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SYNTHETIC DETERGENT COMPOSITIONS

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The present invention relates to new synthetic detergent compositions and, more particularly, to compositions of the type of sulfated and sulfonated organic detergents having improved properties and to a process for preparing the same.

Various additives have been incorporated in detergent mixtures in a wide range of concentrations to modify the properties of synthetic detergent compositions in a desired manner. These additives individually may effect one or more of the following properties or mechanisms involved in the action of the detergent composition including foaming, foam stability, dispersion, suspension, interfacial tension, modification of micellar structure, etc. In view of the varied nature of many synthetic detergents, additives in general exhibit a certain degree of specificity of action.

It is known for example, that the lower polyhydric alcohols have been used as emulsifying or wetting agents in certain relationships. In addition, German Patent Number 700,677 issued December 27, 1940, discloses that long chain diols are foam inhibitors in certain solutions.

It has now been discovered, however, that the presence of minor proportions of aliphatic glycols having a straight chain of about 10 to 20, and preferably about 14 to 18 carbon atoms, and having adjacent and essentially terminal hydroxyl groups in synthetic non-soap water soluble detergents of the type of sulfated and sulfonated organic detergents give improved foaming and/or deterging properties. These improvements are unique since the diols per se have in general neither foam producing nor deterging properties.

The synthetic organic non-soap water soluble detergents of the class consisting of sulfates and sulfonates comprised by the novel compositions of the invention may be prepared from organic materials which are applicable to sulfonation ("true sulfonation" and/or sulfation) especially those having about 8 to about 22 and preferably about 12 to about 20 carbon atoms to the molecule, including fatty oils, unsaturated fatty acids, mineral oils, mono- and diglycerides, partial esters or ethers of polyglycols, esters or ethers of glycols, aromatic and alkylated aromatic compounds, alcohols, olefins, etc. The sulfonated or sulfated organic compounds include sulfonated mineral oil, sulfonated fatty acids and oils, aromatic sulfonates and sulfates, etc. Of the vast variety of sulfonates and sulfates suitable as active ingredients in detergent compositions, it is

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preferred to use the aliphatic sulfates and sulfonates of about 8–22 carbon atoms and the alkyl aromatic sulfonates.

The alkyl aromatic sulfonate detergents referred to are well known in the art. They may be mononuclear or polynuclear in structure. More particularly, the aromatic nucleus may be derived from benzene, toluene, zylene, phenol, cresols, phenol ethers, naphthalene, derivatives of phenanthrene nuclei, etc. It has also been found that the alkyl group may vary similarly. Thus, for example, the alkyl group may consist of such radicals as dodecyl, hexyl, octyl, nonyl, decyl, keryl, mixed alkyls derived from fatty materials, cracked paraffin wax olefins, and polymers of lower mono olefins, etc. While the number of sulfonic acid groups present on the nucleus may vary, it is usual to have only one such group present in order to preserve as much as possible a balance between hydrophilic and hydrophobic portions of the molecule.

More specific examples of suitable alkyl aromatic sulfonate detergents are the propylated naphthalene sulfonates, the mixed butyl naphthalene sulfonates, tetrahydronaphthalene sulfonates, the various butylated diphenyl sulfonates and phenylphenol sulfonates. It is preferred however, to use the higher alkyl aromatic sulfonates rather than the lower alkyl substituted detergents. Typical examples of this preferred class are the sulfonated and alkylated benzene type compounds wherein the alkyl group is at least about 8 and preferably about 10 to about 16 carbon atoms. The benzene ring may possess other substituents including lower alkyl and hydroxy groups.

The invention is also particularly applicable to the surface-active sulfated or sulfonated aliphatic compounds of about 8–22 carbon atoms. Within the scope of such definition are the sulphuric acid esters of polyhydric alcohols incompletely esterified with higher fatty acids, e. g. coconut oil monoglyceride monosulphate, tallow diglyceride monosulphate; the long chain pure or mixed alkyl sulfates e. g. lauryl sulfate, cetyl sulfate; the hydroxy sulfonated higher fatty acid esters, e. g. higher fatty acid esters of 2,3 dihydroxy propane sulfonic acid; the higher fatty acid esters of low molecular weight alkylol sulphonic acids, e. g. oleic acid ester of isethionic acid; the fatty acid ethanolamide sulfates; the fatty acid amides of amino alkyl sulfonic acids, e. g. lauric amide of taurine, and the like. More particularly, it is preferred to use the sulfated aliphatic compounds containing at least about 8

carbon atoms, especially those having about twelve to about 22 carbon atoms to the molecule.

These detergents are commonly used in the form of their water soluble salts. Of these, the alkali metal (e. g. sodium, potassium) and ammonium salts are preferred though other salts such as the amine, alkylolamine, alkaline earth metals (e. g. calcium, magnesium) salts may be used if desired. Their concentration in the detergent compositions of the present invention is generally at least about 20% by weight of total solids. Compositions with very high concentrations of active ingredient of the order of up to about 90% are prepared for specialized uses generally. With built compositions however, it is preferred to use an active ingredient content of about 20 to about 50% concentration.

The adducts used in the present invention are the aliphatic glycols having a straight chain of about 10 to 20, and preferably about 14 to 18, carbon atoms and having adjacent and essentially terminal hydroxyl groups. These aliphatic glycols may be straight or branched chain, and saturated in structure. Such diols having branched chains may be suitably employed provided that they are only mildly branched, such that there remains a long straight chain hydrophobic portion in the molecule. It is preferred to use the alkane diols having adjacent and terminal hydroxyl groups generally. Examples of suitable alcohols falling within the broad classification are hexadecane 1,2 diol, tetradecane 1,2 diol, octadecane 1,2 diol, dodecane 1,2 diol, hexadecane 2,3 diol and mixtures thereof, etc. It is not necessary to use the pure substances themselves as the commercial mixtures of these substances are also operable and may generally be preferable from the viewpoint of economy. These polyhydric alcohols may be obtained in any suitable manner. They may be obtained, for example, from cracked paraffin waxes, by oxidation of corresponding long chain olefins etc.

These additives may be incorporated with the active ingredient at any point during the manufacturing process at which subsequent operations will not adversely modify the properties of the detergent composition. In general, this addition may be accomplished by adding the alcohols to the active ingredient either in liquid form, or by mixing those materials which are solid under normal conditions in comminuted form. The best results are not achieved by mechanically intermixing the comminuted solid components. A variety of procedures, which have proven to be convenient, economical, and productive of the best results are:

(1) The addition of the alcohols in a molten state to a hot aqueous slurry of the active ingredient of about 40 to 50% concentration with vigorous stirring to form a smooth uniform and homogeneous paste.

(2) The alcohols may be dissolved in a suitable solvent, e. g. ethanol, and added to a slurry of the active ingredient.

(3) A cream emulsion of the alcohols in water with a minor proportion of the active ingredient may be prepared and incorporated into the slurry of active ingredient in the manner set forth above.

Thereafter, these compositions may be made up in the form of solutions, pastes, or as dry or partially hydrated solid products, preferably in a finely divided condition.

The amount of these added long chain alcohols is generally minor in proportion to the weight of the total detergent composition and sufficient to produce a desirable effect on the foaming or total washing power of the detergent composition. Generally, the amount of each additive varies within rather definite proportions of the order of about 1% to about 10% by weight and preferably about 1–5%, since it has been determined that within these somewhat critical limits the desirable effects appear to be attained to a maximum degree.

These results are evident from a consideration of the following data and examples which are merely illustrative of the present invention and it will be understood that the invention is not limited thereto.

The effect of various long chain diols and their concentrations in detergent compositions may be determined from standard soil removal and soil redeposition tests. Briefly, these tests involve the addition of a large number of standard soiled cotton swatches and unsoiled cotton swatches to a detergent solution at 120° F. The system is agitated for 20 minutes in a standard manner and the swatches are then rinsed, dried and examined under a Hunter reflectometer. The increase in reflectance of the soiled swatches is an indication of the detergency or soil removal value and the decrease in reflectance of the unsoiled cloths is the redeposition value. The values in Tables I and II are expressed in Hunter Units$\times 10^3$. A higher value in the soil removal column is an indication of better washing power, and lower values in the soil redeposition column are more desirable.

Using a 0.25% concentration in distilled water of a detergent composition comprising 40% salts of higher alkyl benzene sulfonates and 60% sodium sulfate, and varying the diol content as disclosed in Table I, the following results are obtained.

TABLE I

Additive	Percent	Soil Removal	Soil Redeposition
1. Blank		110	140
2. C_{16}-1,2 diol	1	124	129
	2	145	114
	3	135	93
	4	118	75
	5	124	79
	6	115	58
3. C_{18}-1,2 diol	1	120	112
	2	131	126
	3	139	87
	4	130	71
	5	128	57
4. C_{14}-1,2 diol	1	118	146
	2	122	108
	3	128	81
	4	125	93
	5	121	84

Referring to the soil removal column in Table I, it will be noted that the various diols in minor proportions consistently gave improved results for soil removal. The optimum concentration for an improvement in soil removal varies of course with each particular diol. Thus, it is seen that with the hexadecane diol, best soil removal results are obtained at the 2% level, whereas with the C_{18} and C_{14} diols, best results for soil removal are obtained at 3% concentrations. Similarly, improved results are obtained on soil redeposition and, in general, it may be stated that the higher the percentage of diol additive, the greater the inhibition of the amount of soil redeposition. Since the total washing power is

the result of the combined effect of soil removal and soil redeposition it will be necessary to integrate the improvements attained in each of these two factors to determine the optimum concentration of diol for a particular detergent composition. This optimum concentration must be determined also in the light of the washing conditions to be employed for each detergent composition and the particular use for which the composition is recommended, e. g. machine washing, hard or soft water, etc.

Though the sulfonated and sulfated detergents containing the diol adducts may be used as a relatively pure mixture of these components, it is common however to employ various adjuvant materials in synthetic detergent compositions. These builders or additives may be inorganic or organic in structure and may be mixed with the active ingredient in any suitable manner. Such adjuvant materials may include any of the substances employed by the art in admixture with these sulfonated and sulfated detergents generally, provided the use of any such material does not completely neutralize or remove the effectiveness of the diol additives. It has been found that these added materials may vary greatly both in structure and in concentration without impairing the improved results of the compositions referred to herein. Thus, such conventional inorganic builders or additives as the silicates, various alkali metal phosphates (e. g. hexametaphosphate, tripolyphosphate, tetrapyrophosphate) the alkali metal sulfates, carbonates, etc. may be employed in these compositions. Organic materials such as carboxymethylcellulose salts, esters (e. g. ethylene glycol monostearate, methyl palmitate) and the like may also be used under suitable conditions.

The detergency tests are repeated on a 0.25% concentration in distilled and in hard water of a built detergent composition comprising 40% sodium salts of higher alkyl benzene sulfonates, 12.5% sodium silicate, 12.5% sodium phosphates, the remainder being essentially sodium sulfate with and without hexadecane 1,2 diol as the organic additive. The results are tabulated below:

TABLE II

Percent Diol	Distilled Water		Hard Water (300 p. p. m. Ca)	
	Soil Removal	Soil Deposition	Soil Removal	Soil Deposition
None	114	106	106	130
2	143	78	83	133

It is evident from the data in Table II that a marked improvement in total detersive power of the above composition in distilled water is achieved from the use of the long chain diols. In hard water it may be noted that the use of the diols in this particular composition resulted in decreased detergency, primarily due to a marked decrease in soil removal. It is thus evident that there is some degree of specificity of action in the use of the long chain diols. The above diol containing composition used in Table II therefore is excellent in soft water.

Using essentially the same detergent composition but with added 0.5% sodium carboxymethylcellulose, the following results on soil removal and redeposition are obtained at 0.25% concentration:

TABLE III

Percent Diol	Distilled Water	
	Soil Removal	Soil Deposition
None	121	33
1	111	27
2	149	18
3	165	15
5	164	10
	Hard Water (300 p. p. m. Ca)	
None	111	22
2	117	8
3	117	26

It may be noted that in distilled water, 1% diol is ineffective to improve the soil removal power of this particular composition at 0.25% concentration. Larger additions of diol however are effective for markedly improved detergency. All diol concentrations appeared to inhibit soil redeposition. It is apparent therefore that the particular builders used herein modified the action of the diol somewhat since 1% diol is effective for both soil removal and soil redeposition in the composition which gave the results set forth in Table I above.

It is to be noted moreover that improved detergency in hard water is effected by this composition due to the combined action of the diol adduct and the sodium carboxymethylcellulose.

Example I

To 97 parts of commercial sodium salts of coconut oil monoglyceride sulfates containing about 31% active ingredient, there are added 3 parts of hexadecane 1,2 diol. At washing concentrations of about 0.15% no significant increase in detergency is obtained from the use of the diol additive in the detergent composition. At higher washing concentrations of the order of about 0.5%, a marked improvement in detergency results from the use of this composition containing the diol adduct. It is also indicative that for each detergent composition containing the diols there are optimum washing conditions which must be determined in order to obtain the maximum beneficial results.

It is a significant feature of this invention that these long chain diols exert a beneficial effect on the foaming properties of detergent compositions containing the aliphatic sulfated and sulfonated detergents, having preferably about 8–22 carbon atoms. The desirable effect of the diols on the foam of such detergents as the long chain normal alcohol sulfates, fatty acid monoglyceride sulfates, fatty acid ethanolamide sulfates, etc. is unique and in marked contrast to the general adverse effect on foaming produced by the diols on alkyl aryl sulfonated detergents. It has been found that the diol additives decrease the foam stability of the alkyl aryl sulfonates though as indicated supra the diols markedly improve their detergency.

The detergent compositions containing the sulfated and sulfonated aliphatic detergents and the long chain diol additives are characterized by increased stability of the foam produced in washing operations in comparison to the foaming effects produced by these compositions without the diol additives. The fact that the diol adducts in the particular relationship set forth produce foams and suds which are more stable,

do not readily break down by evaporation, have in general a long drainage time and contain more liquid, are significant and desirable properties for a detergent composition.

Moreover, it has been found that in general, the diol adducts in these compositions tend to increase the tolerance of these detergent compositions in the assimilation or holding in suspension of a maximum amount of dirt, grease, etc. with less foam loss than is found without the use of these additives.

The effects on the foaming characteristics can be studied quantitatively for a given composition by means of a foam consistency test. Briefly, this test consists of the formation of a foam by standardized agitation of 500 cc. of a detergent at 110° F. in a two quart unsilvered Dewar flask. The foam formed after a 10 minute agitation period is then measured with a consistometer after standing for 5, 10 and 15 minutes. The readings are an indication of the foam consistency or bodying effect. It has been arbitrarily determined using a standard consistometer that a value below about 275 units represents relatively low viscosity, a value of 275–350 intermediate consistency, and above 350 units is high consistency.

This consistometer is a means for measuring the minimum torque necessary for rotation of a paddle of any standard size through a foam. This device applies the torque by means of a coil spring which has its inner end attached to a paddle shaft and the outer end attached to a circular plate which can be rotated. The degrees through which the spring may be twisted before the paddle starts to move in the foam may be readily determined. An indicator needle is attached to the top of the paddle shaft and a circular scale divided into 360° is set on the plate which holds the outer end of the spring. The paddle shaft is held in place by a pair of ball bearing races in such a way that it can turn freely.

The foam consistency test is conducted in distilled water using a detergent composition comprising essentially 30.9% coconut oil monoglyceride sulfate salts, 7.5% sodium phosphates, and the remainder sodium sulfate with and without diol additives. The results using a 0.25% concentration of the detergent composition are set forth in Table IV. The values given in the tables below represent the averages of the three readings at 5, 10 and 15 minute intervals.

TABLE IV

Additive	Percent Added	Foam Consistency
1. None		220
2. Hexadecane 1,2 diol	4	470
3. Mixed Higher Alkyl 1,2 diols (Average molecular wt. 236)	2	350
4. Mixed Higher Alkyl 1,2 diols (Average molecular wt. 236)	4	450

The data in the table indicates the remarkable effectiveness of the long chain diols as foam stabilizers on such detergent compositions.

The foam consistency test is repeated in distilled water using a 0.25% concentration of a detergent composition containing about 33% salts of higher alkyl sulfates derived from coconut oil and a high sodium sulfate content with and without diol additives. The superior foaming properties of the diol-containing alkyl sulfate detergents are evident from the data in Table V setting forth the results of the above test.

TABLE V

Additive	Percent Added	Foam Consistency
1. None		210
2. Tetradecane 1,2 diol	4	450
3. Hexadecane 1,2 diol	1	490
4. Hexadecane 1,2 diol	4	520
5. Mixed Higher Alkyl 1,2 diols (Average molecular wt. 236)	4	480

These effects are apparent in hard water solutions also. Thus, 4% hexadecane 1,2 diol in the alkyl sulfate detergent composition of Table V had a foam consistency of 540°.

Example II

To a detergent composition comprising 40% sodium dodecane sulfonate and 60% sulfate, there is added 2% of hexadecane 1,2 diol. The foam consistency test is performed using a 0.25% concentration of this mixture in distilled water. This detergent composition exhibits excellent foam stability since it had a consistency yield value of 460.

Example III

To a detergent composition comprising 40% sodium lauryl sulfate and 60% sodium sulfate, there is added 2% of hexadecane 1,2 diol. The foam consistency test is performed using a 0.25% concentration of this mixture in distilled water. This detergent composition also exhibits effective foam stability since it had a consistency yield value of 460.

Example IV

Using a 0.25% concentration in distilled water of a detergent composition comprising 30% magnesium coconut oil monoglyceride monosulfate as the active ingredient, there is obtained a foam consistency value of 230. With the addition of 2% hexadecane 1,2 diol a foam consistency value of 310 is attained, thereby indicating improved foam stability due to the presence of the diol additive.

Certain general conclusions are apparent from the many tests which have been conducted to determine the effectiveness of the long chain diols in the relationship set forth. The most appropriate diol and its most effective concentration for each particular sulfonated or sulfated detergent composition may be suitably determined by routine controls. In each case the intended use (e. g. hard or soft water, hair shampoos or machine washing compositions, etc.) and the proper washing conditions should be taken into consideration in order to derive the maximum beneficial effects.

The term "consisting essentially of" as used in the definition of the ingredients present in the composition claimed is intended to exclude the presence of other materials in such amounts as to interfere substantially with the properties and characteristics possessed by the composition set forth but to permit the presence of other materials in such amounts as not substantially to affect said properties and characteristics adversely.

Although the present invention has been described with reference to particular embodiments and examples, it will be apparent to those skilled in the art that variations and modifications of this invention can be made and that equivalents

can be substituted therefor without departing from the principles and true spirit of the invention.

Having described the invention, what is desired to be secured by Letters Patent is:

1. A detergent composition consisting essentially of detergent selected from the group consisting of water-soluble organic sulfate and sulfonate detergents, and a minor proportion from about 1 to about 10% by weight of a higher alkane 1,2 diol having a straight-chain of about 10 to about 20 carbon atoms.

2. A detergent composition consisting essentially of detergent selected from the class consisting of water-soluble organic sulfate and sulfonate detergents and a minor proportion from about 1 to about 10% by weight of a saturated aliphatic 1,2 dihydric alcohol having a straight-chain of about 14 to 18 carbon atoms.

3. A detergent composition consisting essentially of water-soluble higher alkyl aryl sulfonate detergent, and a higher alkane 1,2 diol having a straight-chain of about 10 to about 20 carbon atoms in an amount from about 1 to about 10% of said detergent composition.

4. A detergent composition consisting essentially of water-soluble higher alkyl aryl sulfonate detergent, and a higher alkane 1,2 diol having a straight-chain of about 14 to about 18 carbon atoms in an amount from about 1 to about 10% by weight of the detergent composition.

5. A detergent composition consisting essentially of water-soluble higher alkyl benzene monosulfonate detersive salt and hexadecane 1,2 diol in an amount from about 1 to about 10% by weight of the detergent composition.

6. A detergent composition consisting essentially of water-soluble aliphatic sulfate detergent and a higher alkane 1,2 diol having a straight-chain of about 14 to 18 carbon atoms in minor proportion from about 1 to about 10% by weight of the detergent composition.

7. A detergent composition consisting essentially of water-soluble higher alkyl sulfate detergent, and a higher alkane 1,2 diol having a straight-chain of about 10 to about 20 carbon atoms in an amount from about 1 to about 10% by weight of the detergent composition.

8. A detergent composition consisting essentially of water-soluble higher alkyl sulfate detergent, and an amount of a higher alkane 1,2 diol having a straight-chain of about 14 to 18 carbon atoms from about 1 to about 10% by weight of the detergent composition.

9. A detergent composition consisting essentially of water-soluble detersive salt of sulphuric acid esters of polyhydric alcohols incompletely esterified with higher fatty acids, and a higher alkane 1,2 diol having a straight-chain of about 10 to about 20 carbon atoms in an amount from about 1 to about 10% by weight of the detergent composition.

10. A detergent composition consisting essentially of water-soluble detersive sulphuric acid esters of polyhydric alcohols incompletely esterified with higher fatty acids, and an amount of higher alkane 1,2 diol having a straight-chain of about 14 to 18 carbon atoms from about 1 to about 10% by weight of the detergent composition.

11. A detergent composition consisting essentially of detergent selected from the group consisting of water-soluble organic sulfate and sulfonate detergents, and a minor proportion of a compound selected from the group consisting of 1,2 and 2,3 higher saturated aliphatic glycols having a straight-chain of about 10 to about 20 carbon atoms in an amount sufficient to improve the soil removal power thereof.

12. A detergent composition consisting essentially of detergent selected from the group consisting of water-soluble organic sulfate and sulfonate detergents, and a minor proportion of a straight-chain higher alkane 1,2 diol having about 10 to about 20 carbon atoms in an amount sufficient to improve the soil removal power thereof.

13. A detergent composition consisting essentially of detergent selected from the group consisting of water-soluble organic sulfate and sulfonate detergents, and a straight-chain higher alkane 1,2 diol having about 14 to about 18 carbon atoms in minor proportion and sufficient to improve the soil removal power thereof.

14. A detergent composition consisting essentially of water-soluble higher alkyl aryl sulfonate detergent, and a higher alkane 1,2 diol having a straight-chain of about 10 to about 20 carbon atoms in minor proportion and sufficient to improve the soil removal power thereof.

15. A detergent composition consisting essentially of water-soluble higher alkyl sulfate detergent, and a higher alkane 1,2 diol having a straight-chain of about 10 to about 20 carbon atoms in minor proportion and sufficient to improve the soil removal power thereof.

16. A detergent composition consisting essentially of water-soluble higher fatty acid monoglyceride sulfate detergent, and a higher alkane 1,2 diol having a straight-chain of about to about 20 carbon atoms in minor proportion and sufficient to improve the soil removal power thereof.

17. A detergent composition consisting essentially of water-soluble aliphatic sulfate detergent, and a minor proportion of a straight-chain alkane 1,2 diol of about 14 to about 18 carbon atoms sufficient to improve the foam consistency thereof.

18. A detergent composition consisting essentially of about 20 to about 50% by weight of detergent selected from the group consisting of water-soluble organic sulfate and sulfonate detergents, in minor proportion thereto and from about 1 to about 10% by weight of a saturated aliphatic 1,2 glycol having a straight-chain of about 10 to about 20 carbon atoms, and the balance being water-soluble builders.

19. A detergent composition consisting essentially of about 20 to about 50% by weight of detergent selected from the group consisting of water-soluble organic sulfate and sulfonate detergents, in minor proportion thereto and from about 1 to about 10% by weight of an alkane 1,2 diol having a straight-chain of about 10 to about 20 carbon atoms, and the balance being water-soluble builders selected from the group consisting of water-soluble inorganic sulfates, phosphates and mixtures thereof.

20. A detergent composition consisting essentially of about 20 to about 50% by weight of detergent selected from the group consisting of water-soluble organic sulfate and sulfonate detergents, in minor proportion thereto and from about 1 to about 10% by weight of an alkane 1,2 diol having a straight-chain of about 14 to about 18 carbon atoms, and the balance being water-soluble inorganic builders.

21. A detergent composition consisting essentially of water-soluble higher alkyl sulfate detersive salt, and a minor proportion of hexadecane 1,2 diol in an amount from about 1 to about 10% by weight of the detergent composition.

22. A detergent composition consisting essen-

tially of water-soluble higher fatty acid monoglyceride monosulfate detersive salt, and a minor proportion of hexadecane 1,2 diol in an amount from about 1 to about 10% by weight of the detergent composition.

23. A detergent composition consisting essentially of detergent selected from the group consisting of water-soluble organic sulfate and sulfonate detergents, and a minor proportion of a compound selected from the group consisting of 1,2 and 2,3 higher saturated aliphatic glycols having a straight-chain of about 10 to about 20 carbon atoms in an amount from about 1 to about 10% by weight of the detergent composition.

24. A detergent composition consisting essentially of water-soluble higher alkyl sulfate detergent, and a minor proportion of an alkane 1,2 diol of about 14 to about 18 carbon atoms sufficient to improve the foam consistency thereof.

25. A detergent composition consisting essentially of water-soluble higher fatty acid monoglyceride monosulfate detergent, and a minor proportion of an alkane 1,2 diol of about 14 to about 18 carbon atoms sufficient to improve the foam consistency thereof.

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