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DETERGENT COMPOSITION

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The present invention relates to detergent compositions having controlled foaming power in both hard and soft water.

Having had many years experience with the use of soap base detergent compositions for the washing of fabrics the public has generally come to associate foaming with washing power. However carboxylic acid soaps are not as satisfactory for use in hard water as are certain synthetic detergents which are resistant to the otherwise undesirable effects of hard water, and therefore most detergent compositions now used by the housewife employ such a synthetic detergent. These synthetic detergents are generally employed in a composition designed to possess foaming and cleansing properties characteristic of the heavy duty soaps which they replaced. Since the volume of foam is generally considered by the housewife to be indicative of the cleansing power of the composition being employed, most modern heavy duty synthetic detergent compositions are designed to foam as generously as possible.

For most purposes such generously foaming detergent compositions are satisfactory. However, it has been found that when washing fabrics in tumbler type household automatic washing machines it is undesirable to employ generously foaming detergent compositions because of the prolific foam-producing action of these machines. Thus if too high a concentration of a generously foaming washing agent is employed in these machines "spill-over" results. That is, the volume of foam produced is such as to completely fill the machine, escape through the port normally provided at the top of the machine for supplying detergent or bleach or other material thereto, and spill over on to the floor on which the machine stands. This is inconvenient to clean up and may mar the floor.

A second consequence of the presence of copious amounts of foam in such machines is a hindrance, by such foam, of the mechanical tumbling and rubbing action of the fabrics being washed. This is an undesirable result as such mechanical action aids in the removal of soil from the fabrics by the detergent solution being used.

A further important disadvantage of the use of a generously foaming composition in such machines is a mechanical interference with the operation of the machine known as "suds-lock." Suds lock normally occurs when the machine reaches that portion of its cycle wherein the perforated basket or tumbler is rotated at a high velocity to expel by centrifugal force the liquid held by the clothes in the machine. If the liquid being expelled foams sufficiently, the foam fills the space between the outside of the rapidly rotating perforated tumbler and the surrounding stationary enclosure and frequently exerts such a retarding force or drag on the spinning tumbler as to overload the motor of the machine causing a fuse or an overload relay to act to stop the machine. In this case the clothes must be removed from the machine and be rung and rinsed by hand so as to lighten the load on the machine. In other instances the machine is not stopped, but the speed of the tumbler is so reduced by the drag of the foam as to insufficiently expel the liquid from the clothes being washed and thus the clothes are not properly rinsed.

"Spill-over" and "suds-lock" are commonly experienced if the concentration of a generously foaming detergent is sufficient to do a satisfactory cleansing job on clothes which have a light soil load. Thus it has been found that in soft water it is not possible to use a sufficient concentration of a typical heavy duty commercial soap composition on a lightly soiled load of wash without experiencing "spill-over" and "suds-lock." These difficulties occur even more prevalently and with more heavily soiled loads when modern generously foaming synthetic detergent compositions are employed.

Thus there is a substantial need for detergents having controlled foaming properties in conjunction with a high degree of detersive power for use in automatic tumbler type household washing machine. However, since the housewife associates foaming with washing, for aesthetic purposes it is desirable to provide washing compositions for this use which will form a stable foam of minimum but sufficient volume to indicate the presence and approximate concentration of the detergent composition that is being employed but which will not spill over nor interfere with the mechanical action of these machines. Furthermore, it is highly desirable that such compositions exhibit substantially uniform foaming power in both hard and soft water.

In accordance with the invention, detergent compositions are prepared possessing a high degree of detergent power and the ability to produce a suitable minimum amount of foam when used in tumbler type automatic washing machines in normal concentrations for proper cleansing action in either hard or soft water. This unusual result is obtained by a novel combination of certain otherwise generously foaming washing agents and a foam controlling and detergency improving additive.

The composition of the invention consists essentially of a water soluble polyalkylene oxide detergent condensate of a hydrophobic compound selected from the group consisting of alkyl phenols and higher aliphatic monohydric alcohols, a water soluble salt of a higher alkyl aryl sulfonate detergent, and a higher aliphatic alcohol. In the present compositions the foam generated by the mixture of the non-ionic detergent and the sulfonated detergent is controlled by the higher aliphatic alcohol which is present as a minor proportion of the mixture. The compositions of the present invention, which are excellent detergents, may be prepared in liquid, paste or powder form and may be associated with inorganic builder salts as well as other adjuvant materials.

The non-ionic detergent condensates of the present invention are polyalkeneoxy ethers of a hydrophobic compound selected from the group consisting of alkyl phenols and higher aliphatic monohydric alcohols. The degree or proportion of the hydrophilic polyalkeneoxy groups present in a particular condensate will vary with the specific hydrophobic group therein, generally increasing as the number of carbon atoms in the hydrophobic group increases so as to be sufficient to confer the desired water solubility and detersive properties on the final product. These detergents are known in the art and determination of a specific hydrophilic:hydrophobic relationship is not the essential novelty of the present invention. It is preferred to employ the polyoxyethylene condensates derived from ethylene oxide although other lower alkylene oxides, such as propylene oxide, butylene oxide and the like have generally similar properties and may be substituted therefor. While the number of alkeneoxy groups is controlled so as to yield the desired water solubility and detersive properties and is dependent upon

the character of the hydrophobic group, the detergent condensates included in the present invention will possess at least 5 and usually about 5 to 50 alkeneoxy groups. For example the number of ethenoxy groups per molecule of condensate may be about 7.5, 8.5, 11.5, 20.5 or 30, the range from about 8 to 20 being preferred.

The hydrophobic portion of the non-ionic detergent of the present invention may be an alkyl phenol which has an alkyl group of at least about 5 and usually 8 to 20 carbon atoms. For example the alkyl substituent on the aromatic nucleus may be diisobutylene, diamyl, isooctyl, nonyl, ethyl hexyl, polymerized propylene, dimerized C_6–C_7 olefin, and the like. Preferred substituents are the iso-octyl and nonyl groups. Another class of compounds which may act as the hydrophilic portion of the non-ionic detergent of the present invention consists of the higher aliphatic monohydric alcohols. These alcohols have from about 8 to 22 carbon atoms, may have straight or branched chains, and may be saturated or unsaturated. Examples thereof are iso-octyl, nonyl, decyl, dodecyl, tridecyl, tetradecyl, hexadecyl, octadecyl and oleyl alcohols which may be condensed with an appropriate amount of ethylene oxide, such as at least about 6, and preferably about 10–30 moles. A typical product is tridecyl alcohol condensed with about 12, 15 or 20 moles of ethylene oxide per mole of tridecyl alcohol.

The water soluble higher alkyl aryl sulfonate salt used in compositions of the present invention may be mononuclear or polynuclear in structure. More particularly the aromatic nucleus may be derived from benzene, toluene, xylene, phenol, cresols, naphthalene, etc. The alkyl substituent on the aromatic nucleus may vary widely, as long as the desired detergent power of the active ingredient is preserved. While the number of sulfonic acid groups present on the nucleus may vary it is usual to have one such group present in order to preserve as much as possible a balance between the hydrophilic and hydrophobic portions of the molecule.

More specific examples of suitable alkyl aromatic sulfonate detergents are water soluble salts of the higher alkyl aromatic sulfonates. The higher alkyl substituent on the aromatic nucleus may be branched or straight-chain in structure; it comprises moreover such groups as decyl, dodecyl, keryl, pentadecyl, mixed long-alkyls derived from long-chain fatty materials, cracked paraffin wax olefins, polymers of lower monoolefins, etc. Preferred examples of this class are the higher alkyl mononuclear aryl sulfonate salts wherein the alkyl group is about 8 to about 20, and preferably about 12 to 15 carbon atoms. More particularly, it is preferred to use the higher alkyl benzene sulfonate salts wherein the higher alkyl group is about 12 to 15 carbon atoms. For example, propylene may be polymerized to the tetramer and condensed with benzene in the presence of a Friedel-Crafts catalyst to yield essentially the dodecyl benzene derivative which is suitable for sulfonation and neutralization to the desired sulfonate salts.

The higher aliphatic alcohols used in the compositions of the present invention are those of at least about 8 and preferably about 10 to about 18 to 20 carbon atoms. These aliphatic alcohols may be saturated or unsaturated in character. It is preferred to use the saturated primary alcohols. Examples of suitable alcohols falling within this classification are decanol, dodecanol, tetradecanol, hexadecanol and octadecanol. It is also within the contemplation of the present invention to employ unsaturated higher aliphatic alcohols (e. g. oleyl alcohol), branched chain and secondary higher aliphatic alcohols, and higher aliphatic diols. It is not necessary to use the pure substances themselves as the commercial mixtures of these substances are also operable and are preferred from the viewpoint of economy. Thus, commercial mixtures of fatty alcohols containing predominantly the alcohols of 10 to 18 carbon atoms are included within the scope of this invention, even though such mixtures may contain minor amounts of fatty alcohols of different chain length.

The aliphatic alcohols may be derived either from natural or synthetic sources. Many naturally occurring wax esters are an important source of higher aliphatic alcohols. Certain animal oils, chiefly those of marine origin such as sperm oil, also contain a high proportion of recoverable alcohols occurring as esters. The most plentiful and economic sources for their production however are their preparation from fatty acids or aldehydes by reduction, or their recovery from oxidized petroleum stocks, and the like, by processes known in the art, e. g. the Oxo process.

The ratios in which the essential components of the present novel compositions will be employed are a function of the components used and the desired foaming characteristics of the end product. It has been found that the non-ionic detergent condensates used in the present invention foam more generously in soft than in hard water, and the converse has been found true of the alkyl aryl sulfonate salts of the present invention. Therefore the foaming characteristics of the final composition may be adjusted to a certain extent by varying the ratios of these two components. However the aliphatic alcohol is the primary means for controlling the foaming property of the present compositions, acting to reduce the amount of foam produced and to substantially equalize the amount of foam produced by particular compositions when used in hard water on the one hand or in soft water on the other. The particular proportions of the three essential components may therefore vary considerably within the limits wherein the ratio of non-ionic condensate to alkyl aryl sulfonate detergent is from about 10:1 to about 1:2 by weight, and the ratio of the non-ionic condensate to the higher aliphatic alcohol is from about 40:1 to about 1:1 by weight. In general it is preferred that there be more non-ionic condensate present than alkyl aryl sulfonate detergent, and that there be more alkyl aryl sulfonate detergent present than there is higher aliphatic alcohol.

It is one embodiment of the invention to utilize the detergent condensate, the alkyl aryl sulfonates, and the higher aliphatic alcohol of the present invention to prepare a liquid detergent composition. In such compositions it is usually desirable that the proper proportions of the ingredients essential to the present invention be incorporated in a suitable solvent medium such as ethanol or isopropanol. Other suitable lower aliphatic alcohols may be employed if desired, and water may be used as a diluent in compatible amounts. The total concentration of the non-ionic detergent condensate, alkyl aryl sulfonate and the higher aliphatic alcohol in the liquid composition should usually be sufficient to produce a concentrated solution such as about 10 to 90% by weight.

It is another embodiment of the present invention to prepare dry detergent compositions by mixing the proper proportions of the essential components of the present invention with sufficient suitable inorganic salt, normally a major proportion, to produce an apparently dry composition.

Other adjuvant materials may be employed also. The detergent compositions of the present invention may include any of those substances employed by the art in admixture with detergent compositions generally, provided the use of any such materials does not neutralize or remove the desired effects. These adjuvant builders, additives or like materials may be inorganic or organic in structure and may be mixed with the essential ingredients in any suitable manner. Such inorganic water soluble builder salts as the various alkali metal phosphates, particularly the molecularly-dehydrated polyphosphate salts may be employed in a suitable manner. Examples of phosphate builders are pentasodium tripolyphosphate, hexasodium hexametaphosphate, tetrasodium pyrophosphate, etc. Other water soluble inorganic builder salts

are sodium silicate, sulfate, carbonate, etc. In the case of such built compositions the three essential components of the present invention, present in the proper proportions, together comprise from about 2 to 90% and usually about 5 to 20% of the total composition, and the water soluble inorganic builder salts comprise about 10 to 98% and usually about 80 to 95% of the total composition by weight. Preferably such compositions contain the inorganic builder salts in major proportions.

Those compositions containing sufficient proportions of added inorganic salts to produce powdered products may be prepared for use in any suitable manner, i. e. a suitable mixture containing hydratable inorganic salt may be agitated with a small amount of water so as to hydrate the hydratable inorganic salt present and cause agglomeration thereof and adsorption of the organic constituents, or the components may simply be mixed, or they may be slurried with water and spray dried. In the event the components are slurried and spray dried, it may be desirable in some instances to include in the slurry a dispersing agent to help maintain uniformity as it has been found that under certain conditions solids settle out and/or an oily layer separates from such slurries. Suitable dispersing agents are the alkali metal salts, usually the sodium salt, of the condensation product of formaldehyde and naphthalene sulfonic acids, particularly alkyl naphthalene sulfonic acids.

Suitable organic materials such as sodium carboxymethylcellulose or other suitable organic additives may also be employed as desired with the compositions of the present invention.

By stating that a detergent composition has "the ability to produce a suitable minimum amount of foam when used in tumbler type automatic washing machines in normal concentrations for proper cleansing in either hard or soft water" it is meant that an approximately ¼% solution of the detergent composition in either hard (e. g. about 300 p. p. m. hardness) or soft (e. g. about 50 p. p. m. hardness) water at about 120° F. foams to a height of at least ½ but not more than 5 inches during washing of household linens of average soil load in a household horizontal tumbler type automatic washing machine.

The following examples are given to additionally illustrate the nature of the invention and it will be understood that the invention is not limited thereto. All parts are by weight unless otherwise specified.

EXAMPLE I

The following composition, which is a preferred formulation, is prepared.

Formula A

	Parts
Non-ionic detergent [1]	10.00
Dodecyl benzene sulfonate, sodium salt	4.00
n-Hexadecanol	1.50
Pentasodium tripolyphosphate	25.00
Soda ash	10.00
Aqueous sodium silicate (43.5% solids, $Na_2O:SiO_2=1:2.35$)	6.00
Carboxymethylcellulose	0.50
Fluorescent dye	0.06
Sodium sulfate	42.94

[1] The non-ionic detergent is a nonyl phenolethylene oxide condensate containing about 9.5 ethenoxy groups per molecule of condensate.

Another composition, Formula B, is prepared containing sodium sulfate in the place of the n-hexadecanol alcohol of Formula A. These two compositions are compared by use in a tumbler type automatic washing machine wherein clothes are washed in a rotating perforated cylindrical basket-like tumbler about 24 inches in diameter. The basket rotates on a horizontal axis, and access is had to it by means of a water-tight door in the front of the machine, the door being located adjacent to the open end of the basket. An 8 inch diameter glass observation port is centrally located in the door and in normal operation of the automatic machine the liquid level during the washing cycle is about at the base of the observation port. A composition is considered to have desirable foaming characteristics for use in such a machine if under normal conditions for satisfactory cleansing foam is produced during the washing cycle to a height approximately ½ to 5 inches above the liquid level. The height of the foam produced during the washing cycle is observed through the observation port at various time intervals after the detergent composition is added. In these runs the amount of the detergent composition being employed is sufficient to constitute 0.26% by weight of the solution in the machine. The water used in these tests is soft water of about 50 parts per million hardness and hard water of about 300 parts per million hardness, the tests being carried out at 120° F. The total washing cycle of the machine is a period of about 10 minutes in length. The results of these tests are given in Table I below.

TABLE I.—AVERAGE WASHING MACHINE FOAM HEIGHT ABOVE BASE OF PORT, IN INCHES

SOFT WATER

Sample	Initial Foam	Washing Time, Minutes						Number of Tests in Each Average
		0	2	3	5	7½	10	
Formula A			0.65	0.80	1.10	1.35	1.65	6
Formula B			4.65	5.85	6.20	6.35	6.70	6

HARD WATER

Formula A			0.32	0.39	0.58	0.81	1.06	6
Formula B			0.31	0.69	0.94	1.13	1.56	6

The data in Table I clearly show that Formula A is a superior product to Formula B in that it produces a stable foam within the desirable range of from ½ to 5 inches in both hard and soft water, whereas Formula B, which lacks the fatty alcohol of Formula A, foams excessively in soft water.

The clothes used in the above tests comprise items such as sheets, pillow cases, bath towels, hand towels, dish towels, face cloths and table cloths which are soiled by home usage and rewashed in Formula A or Formula B respectively six times. In order to determine the detersive efficiency of the composition being tested, a Hunter reflectometer is used to measure the whiteness of these clothes before the first soiling and after the last of six successive soilings and washing. The results of these tests are shown in Table II, a difference of about one unit being significant.

TABLE II.—HOUSEHOLD SOILED ARTICLES—SIX SOILINGS AND WASHINGS

SOFT WATER

Product	Average Units Darker than Original
Formula A	1.4
Formula B	2.3

HARD WATER

Formula A	2.7
Formula B	2.2

The higher the number, the more soil remaining on the article.

The data of Table II show that the fatty alcohol of Formula A significantly improves the detergency thereof in soft water, whereas in hard water there is no significant difference in the detergency of Formulas A and B under the conditions of the test.

Included with each load of wash used for the six soilings and washings of household articles referred to above are cotton swatches which have been artificially uniformly soiled with a standard soil. The whiteness of these swatches is determined as described above before and after each washing as a second measure of the detersive powers of Formulas A and B. Table III shows the average of these six evaluations of each formula. (Note that the data of Table III are based on originally soiled swatches and therefore represent amount of soil removed, whereas the data of Table II above are based on originally unsoiled articles and represent soil which was not removed after soiling and washing.)

TABLE III.—STANDARD SOILED SWATCHES—REFLECTOMETER UNITS LIGHTER THAN ORIGINAL

SOFT WATER

Product	Average Units Lighter	No. of Runs in Average
Formula A	8.2	6
Formula B	7.3	6

HARD WATER

Formula A	7.2	6
Formula B	7.3	6

The higher the number, the cleaner the article.

The data of Table III show again that the fatty alcohol significantly improves the detergency of Formula A in soft water but does not significantly affect the detergency thereof in hard water, in comparison with Formula B.

EXAMPLE II

The following composition represents one having about the maximum permissible foam height in soft water, and a somewhat lower amount in hard water when used in an automatic tumbler-type washing machine as set forth in Example I.

Formula C

	Parts
Tridecyl alcohol-ethylene oxide condensate containing about 12 ethenoxy groups per molecule of condensate	10.00
Dodecyl benzene sulfonate, sodium salt	4.00
n-Hexadecanol	1.50
Pentasodium tripolyphosphate	25.00
Soda ash	10.00
Sodium silicate (27.0% Na_2O; 55.0% SiO_2; 17.5% H_2O)	6.00
Sodium carboxymethylcellulose	0.50
Fluorescent dye	0.06
Sodium sulfate	42.94

Another similar composition containing sodium sulfate in the place of the n-hexadecanol of this example foams excessively, filling the machine beyond the uppermost level of the port, when used in soft water in accordance with Example I.

EXAMPLE III

A suitable liquid detergent comprises:

	Parts
Iso-octyl phenol condensed with about 10 moles of ethylene oxide	20
Tetradecanol	2
Pentadecyl benzene sulfonate, sodium salt	2
Ethanol	76

The ethanol may be partially replaced by water in compatible amounts.

EXAMPLE IV

A satisfactory powdered detergent composition comprises:

	Parts
Oleyl alcohol condensed with about 15 moles of ethylene oxide	5.0
Keryl benzene sulfonate, sodium salt	10.0
Dodecanol	2.0
Tetrasodium pyrophosphate	50.0
Sodium carboxymethylcellulose	0.5
Sodium sulfate	32.5

EXAMPLE V

A suitable composition comprises:

	Parts
Ethyl hexyl phenol condensed with about 15 moles of ethylene oxide	45
Decyl naphthalene sulfonate, potassium salt	45
Decanol	10

EXAMPLE VI

A further suitable composition comprises:

	Parts
Iso-octyl phenol-ethylene oxide condensate having about 10 ethenoxy groups per molecule	10
Tetrapropylene benzene sulfonate, potassium salt	6
Hexadecyl alcohol	3
Pentasodium tripolyphosphate	45
Soda ash	10
Sodium sulfate	26

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 effect 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 thus described the invention, what is claimed is:

1. A detergent composition characterized by a foam height of at least ½ but not greater than 5 inches during the washing of household linens of average soil load in a ¼% solution of said composition in either hard or soft water at about 120° F. in a household horizontal tumbler-type automatic washing machine which consists essentially of a water soluble non-ionic polyalkylene oxide detergent condensate of a hydrophobic compound selected from the group consisting of alkyl substituted phenols and higher aliphatic monohydric alcohols, said alkyl substituent containing from about 5 to about 20 carbon atoms and said condensate containing about 5 to 50 ethylene oxide groups per mole of detergent condensate, a water soluble salt of a higher alkyl aryl sulfonate detergent, and a higher aliphatic alcohol containing from about 8 to 20 carbon atoms, the ratio of said non-ionic condensate to said alkyl aryl sulfonate being from about 10:1 to about 1:2 by weight, and the ratio of said non-ionic condensate to said higher aliphatic alcohol being from about 40:1 to about 1:1 by weight.

2. A detergent composition characterized by a foam height of at least ½ but not greater than 5 inches during the washing of household linens of average soil load in a ¼% solution of said composition in either hard or soft water at about 120° F. in a household horizontal tumbler-type automatic washing machine which consists essentially of a major proportion of inorganic water soluble builder salts and a minor proportion of a mixture

consisting essentially of a water soluble non-ionic polyalkylene oxide detergent condensate of a hydrophobic compound selected from the group consisting of alkyl substituted phenols and higher aliphatic monohydric alcohols, said alkyl substituent containing from about 5 to about 20 carbon atoms and said condensate containing from about 5 to 50 ethylene oxide groups per mole of detergent condensate, a water soluble salt of a higher alkyl aryl sulfonate detergent, and a higher aliphatic alcohol containing about 10 to 18 carbon atoms, the ratio of said non-ionic condensate to said alkyl aryl sulfonate being from about 10:1 to about 1:2 by weight, and the ratio of said non-ionic condensate to said higher aliphatic alcohol being from about 40:1 to about 1:1 by weight.

3. A detergent composition as set forth in claim 2 which contains water soluble inorganic phosphate salts.

4. A detergent composition as set forth in claim 2 wherein said water soluble non-ionic polyalkylene oxide detergent condensate is a polyethylene oxide condensate of a higher aliphatic monohydric alcohol.

5. A detergent composition characterized by a foam height of at least ½ but not greater than 5 inches during the washing of household linens of average soil load in a ¼% solution of said composition in either hard or soft water at about 120° F. in a household horizontal tumbler-type automatic washing machine which consists essentially of a water soluble non-ionic polyethylene oxide condensate of an alkyl phenol, said alkyl group containing from about 5 to about 20 carbon atoms and said condensate containing about 5 to 50 ethylene oxide groups per mole of detergent condensate, a water soluble salt of a higher alkyl benzene sulfonate detergent, said alkyl benzene sulfonate containing from about 8 to 20 carbon atoms in said alkyl radical, and a higher fatty alcohol containing from about 8 to 20 carbon atoms, the ratio of said non-ionic condensate to said alkyl benzene sulfonate being from about 10:1 to 1:2 by weight, and the raito of said non-ionic detergent to said higher fatty alcohol being from about 40:1 to 1:1 by weight.

6. A detergent composition as set forth in claim 5 wherein said fatty alcohol is n-hexadecanol.

7. A detergent composition characterized by the fact that an approximately ¼% solution of said composition in either hard or soft water at about 120° F. foams to a height of at least ½ but not greater than 5 inches during the washing of household linens of average soil load in a household horizontal tumbler type automatic washing machine, said detergent composition consisting essentially of about 2 to 90% by weight of a mixture of a water soluble non-ionic polyethylene oxide detergent condensate of an alkyl phenol having an alkyl group containing about 5 to 20 carbon atoms, said condensate containing about 8 to 20 ethylene oxide radicals per molecule, a water soluble alkyl aryl sulfonate detergent salt having an alkyl group containing about 8 to 20 carbon atoms, and a higher fatty alcohol containing about 10 to 20 carbon atoms, the ratio of said condensate to said sulfonate detergent being from about 10:1 to about 1:2 by weight and the ratio of said condensate to said fatty alcohol being from about 40:1 to 1:1 by weight, and about 10 to 98% of inorganic water soluble builder salts.

8. A detergent composition as set forth in claim 7 which contains pentasodium tripolyphosphate as an inorganic water soluble builder salt.

9. A detergent composition characterized by the fact that an approximately ¼% solution of said composition in either hard or soft water at about 120° F. foams to a height of at least ½ but not greater than 5 inches during the washing of household linens of average soil load in a household horizontal tumbler type automatic washing machine, said detergent composition consisting essentially of a water soluble non-ionic polyethylene oxide condensate of a higher aliphatic alcohol containing from about 8 to about 22 carbon atoms and said condensate containing about 5 to 50 ethylene oxide groups per mole of aliphatic alcohol, a water soluble anionic salt of a higher alkyl benzene sulfonate detergent, said alkyl benzene sulfonate containing from about 8 to 20 carbon atoms in said alkyl radical, and a higher fatty alcohol containing from about 8 to 20 carbon atoms, the ratio of said non-ionic condensate to said alkyl benzene sulfonate being from about 10:1 to 1:2 by weight, and the ratio of said non-ionic detergent to said higher fatty alcohol being from about 40:1 to 1:1 by weight.

10. A detergent composition characterized by the fact that an approximately ¼% solution of said composition in either hard or soft water at about 120° F. foams to a height of at least ½ but not greater than 5 inches during the washing of household linens of average soil load in a household horizontal tumbler type automatic washing machine, said detergent composition consisting essentially of about 2 to 90% by weight of a mixture of a water soluble non-ionic polyethylene oxide detergent condensate of a higher aliphatic alcohol containing about 8 to 22 carbon atoms, said condensate containing about 6 to 30 ethylene oxide radicals per molecule, a water soluble alkyl benzene sulfonate detergent salt having an alkyl group containing about 8 to 20 carbon atoms, and a higher fatty alcohol containing about 10 to 20 carbon atoms, and about 10 to 98% of inorganic water soluble builder salts.

11. A detergent composition as set forth in claim 10 which contains pentasodium tripolyphosphate as an inorganic water soluble builder salt.

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