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LIQUID DETERGENT COMPOSITIONS

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The present invention relates to liquid detergents and, in particular, to liquid detergents in the form of stable pourable suspensions based on soap.

It is generally desirable to produce detergent compositions in the form of liquids in order to obtain convenience of measurement and application. Such liquids must contain the active ingredients in high concentration in order that they shall not be excessively bulky, but must be homogeneous and remain substantially homogeneous on storage in order that successive proportions withdrawn from the container have substantially the same composition. Compositions in which the active ingredients are all present in solution may not be sufficiently concentrated for commercial use but when the concentrations of the ingredients, or of one or some of them are increased above the corresponding solubilities (allowing for the effects of mutual solubilization or salting-out) the undissolved matter normally tends to settle out during storage and the desirable homogeneity is lost. Stable liquid suspensions based on anionic synthetic organic detergents are known, but compositions of this type based on soap have not been described heretofore.

It is an object of the present invention to provide stable, pourable, homogeneous liquid detergent compositions based on soap. Another object of the present invention is to provide a method of preparing such compositions. These and other objects of the present invention will become apparent as the description proceeds.

According to the present invention, a stable, pourable, homogeneous, liquid detergent composition in the form of an aqueous suspension comprises soap, a fatty acid alkanolamide and an alkali-metal tripolyphosphate.

The soap may be a sodium, potassium, ammonium or substituted ammonium soap derived from the oils and fats normally used in soap-making, such as coconut oil, groundnut oil, palm oil, palm kernel oil and tallow. Sodium and potassium coconut oil soaps have been found particularly useful. At least 0.8% of soap must be present in the compositions to ensure their stability. Up to 10%, especially 2 to 6%, by weight of the composition, may be used.

The fatty alkanolamide will be one of a type normally used in detergent compositions and it is preferred to use a mono- or di- lower alkanolamide especially a mono- or diethanolamide, particularly one derived from a C₁₀₋₁₄ fatty acid. Lauric diethanolamide or the diethanolamides of the fatty acids of coconut oil are especially useful. At least 2% of the alkanolamide is required for stability but up to about 15% may be used, a preferred range being 3 to 7%.

The tripolyphosphate to be used may be a sodium or potassium tripolyphosphate, sodium tripolyphosphate being preferred. The amount of this ingredient is not critical, provided that it is in excess of its solubility in the solution of the other ingredients, but for good washing properties it is preferred to use at least 10%, preferably 15 to 35%, by weight of the composition.

Various other ingredients may be added in small proportions without adversely affecting the stability of these compositions such as for instance, lanolin, coloring matters, perfumes, germicides and soil-suspending agents such as sodium carboxymethylcellulose. Where such ingredi-

ents are insoluble in the aqueous phase they are, where sufficiently finely subdivided, held in suspension in the same way as the excess of condensed phosphate.

Certain substances may, however, destabilize the suspensions or convert them into non-pourable pastes and should not be included in these compositions in more than very small amounts, if at all. There may be mentioned particularly: solubilizing agents such as urea, certain fluorescent brightening agents and non-ionic detergents of the ethylene oxide condensate type. Whether or not any particular substance will destabilize or unduly thicken these compositions can readily be found by simple trial in each case.

The compositions are in the form of stable homogeneous liquids, containing part of the tripolyphosphate in suspension and range, in respect of their viscosity, from highly mobile liquids to thick barely pourable creams. The viscosity depends mainly on the concentrations of the alkanolamide and the soap. Higher concentrations of alkanolamide, within the given range, tend to diminish the viscosity while higher concentrations of soap, within the given range, tend to increase the viscosity. Thus a composition with a low concentration of alkanolamide and a high concentration of soap may be too stiff to pour satisfactorily. On the other hand, compositions with a low concentration of alkanolamide and a low concentration of soap tend to be either unstable or to form gels. In general, therefore, when a low concentration of alkanolamide, within the given range (say 2 to 5%) is used, the amount of soap should be within the preferred range of 2 to 6% in order to obtain stable pourable suspensions.

The compositions of the invention may be made by the following procedure:

The tripolyphosphate is added with stirring to the requisite amount of water to give a smooth cream; normally about 1½ times the weight of tripolyphosphate will be required. The soap is dissolved in the remaining water at about 60° C. The alkanolamide is thoroughly incorporated in the soap solution, and the mixture is then added to the tripolyphosphate cream, and the whole is thoroughly mixed. Any minor constituents may then be added.

Some commercial batches of tripolyphosphate do not give the required smooth cream when added to water, but a product containing gritty particles or hard lumps. This difficulty can be overcome either by partially prehydrating the tripolyphosphate—for example, to a water content of about 1%—or by mechanical treatment of the initial product.

Products of the invention have excellent washing and lathering properties, especially for fine goods such as woollens, at suitable dilutions and do not form scum even in very hard water.

The following examples illustrate the present invention without, however, limiting the same thereto.

The following compositions were prepared by the method described above.

Ingredient	Percent by weight		
	Example 1	Example 2	Example 3
Potassium groundnut oil soap	2.0	8.8	6.0
Lauric diethanolamide	3.0	12.0	5.0
Monoethanolamide of coconut oil fatty acids	1.0		
Sodium tripolyphosphate	12.0	25.0	20.0
Water	To 100.0 in each case		

All these compositions formed stable pourable suspensions with viscosities increasing from the mobile liquid of Example 1 to the thick cream of Example 3.

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Example 4

A stable homogeneous suspension was prepared in the manner described above having the following composition:

	Percent	
Potassium coconut oil soap -----	8	5
Lauric diethanolamide -----	10	
Sodium tripolyphosphate -----	25	
Sodium carboxymethylcellulose -----	0.6	
Water -----	To 100.0	10

Example 5

A stable homogeneous suspension was prepared in the manner described above having the following composition:

	Percent	
Potassium groundnut oil soap -----	8.8	15
Monoethanolamide of coconut oil fatty acids -----	10	
Sodium tripolyphosphate -----	25	20
Water -----	To 100	

Example 6

A suitable homogeneous suspension was prepared in the manner described above having the following composition:

	Percent	
Sodium coconut oil soap -----	8	25
Monoethanolamide of coconut oil fatty acids -----	7	
Sodium tripolyphosphate -----	25	30
Water -----	To 100	

We claim:

1. A liquid detergent composition consisting essentially of water and, by weight of the composition, from about 0.8% to about 10% of a water-soluble soap selected from the group consisting of sodium, potassium and ammonium coconut oil, groundnut oil, palm oil, palm kernel oil and tallow soaps; from about 2% to about 15% of a compound selected from the group consisting of the monoethanolamides and diethanolamides of fatty acids containing from 10 to 14 carbon atoms; and from about 10% to about 35% of an alkali metal tripolyphosphate selected from the group consisting of potassium and sodium tripolyphosphate, the tripolyphosphate being present in excess of its solubility in the solution of the other ingredients, the undissolved tripolyphosphate being maintained in stable suspension by the remainder of the composition.

2. A composition according to claim 1 wherein the amount of soap ranges from about 2% to about 6%, the amount of amide ranges from about 3% to about 7%

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and the amount of alkali metal tripolyphosphate ranges from about 10% to about 35%.

3. A composition according to claim 1 containing about 0.6% of a sodium carboxymethylcellulose.

4. A liquid detergent composition consisting essentially of water and, by weight of the composition, from about 0.8% to about 10% of potassium groundnut oil soap; from about 2% to about 15% of a compound selected from the group consisting of the monoethanolamides and diethanolamides of fatty acids containing from 10 to 14 carbon atoms; and from about 10% to about 35% of sodium tripolyphosphate, the tripolyphosphate being present in excess of its solubility in the solution of the other ingredients, the undissolved tripolyphosphate being maintained in stable suspension by the remainder of the composition.

5. A process for preparing a stable liquid detergent composition comprising the steps of adding at least about 10% to about 35% of an alkali metal tripolyphosphate to an amount of water sufficient to form a smooth cream, forming an aqueous solution consisting essentially of about 0.8% to about 10% of a water-soluble soap selected from the group consisting of sodium, potassium and ammonium coconut oil, groundnut oil, palm oil, palm kernel oil and tallow soaps, and from about 2% to about 15% of a compound selected from the group consisting of the monoethanolamides and diethanolamides of fatty acids containing from 10 to 14 carbon atoms, adding said aqueous solution to said smooth cream and mixing, the alkali metal tripolyphosphate being present in excess of its solubility in the solution of the other ingredients with the undissolved tripolyphosphate being maintained in stable suspension by the remainder of the composition, the proportions of ingredients being based on the weight of the final composition.

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