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54 **Liquid cleaning products.**

57 In liquid cleaning products comprising aluminosilicate builder particles dispersed in a liquid solvent phase, gassing caused by the aluminosilicate can be inhibited by incorporation of an alkali-metal meta-silicate, provided that the composition is substantially free of bleach precursor.

Description

LIQUID CLEANING PRODUCTS

The present invention is concerned with substantially non-aqueous liquid cleaning products of the kind comprising particles of aluminosilicate builder dispersed in a liquid phase.

Aluminosilicates are a class of builder very well known in the detergents industry. Their incorporation in non-aqueous dispersions can often result in profound gassing, perhaps caused by evolution of gas trapped in the pores of the aluminosilicate and/or catalytic decomposition of other components.

The applicants have now found that this problem can be substantially mitigated if the composition also contains a specific strongly alkaline material. However, the composition must then be substantially free of bleach precursor which would thus be rendered unstable, unless such a precursor is physically separate from the liquid, eg. by being encapsulated in a material insoluble in the liquid phase of the product but soluble or dispersible in water.

Thus, according to the invention there is provided a substantially non-aqueous liquid cleaning product composition comprising solid particles of aluminosilicate builder dispersed in a liquid phase, said composition also comprising an alkalimetal metasilicate and being substantially free of bleach precursor.

Bleach precursors are conventional materials used to aid low temperature bleaching in combination with inorganic persalt compounds.

The exact mode of action of such precursors is not known, but it is believed that peracids are formed by reaction of the precursors with the inorganic peroxy compound, which peracids then liberate active-oxygen by decomposition.

They are generally compounds which contain N-acyl or O-acyl residues in the molecule and which exert their activating action on the peroxy compounds on contact with these in the washing liquor.

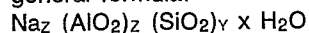
The strongly alkaline material is selected from alkali metal, especially sodium, metasilicate, and mixtures thereof with other alkaline materials such as sodium hydroxide and potassium hydroxide. Normally, they will be incorporated at from 1% to 10%, typically around 5% by weight of the total composition.

UK Patent specification GB-A-2 194 546 (Colgate-Palmolive) describes non-aqueous dispersions of particulate solids for dishwashing. Compositions exemplified therein optionally contain sodium metasilicate in an amount of from 5% to 18% by weight of the total composition. The disclosure envisages use of aluminosilicates in the dishwashing products, but a specific combination of sodium metasilicate with an aluminosilicate builder is not disclosed. Moreover, those compositions all contain a bleach precursor (TAED) which would be incompatible with the compositions of the present invention. Thus, GB-A-2 194 546 does not hint at the problem addressed by the present invention, nor is its

solution suggested.

European Patent Specification EP 28849-A (Unilever) describes non-aqueous built liquid detergent compositions which contain the combination of a specific copolymer and a strongly alkaline material, among examples of which are sodium carbonate, sodium hydroxide and sodium disilicate. The use of sodium metasilicate is not proposed. The liquids may optionally contain bleaches, with or without bleach precursors. Specified builders include sodium tripolyphosphate and zeolites. There is however no mention of the problem to which the present invention relates, nor is a solution thereof suggested.

In the compositions of the present invention, the aluminosilicate builder may be selected from crystalline or amorphous materials, for example having the general formula:



wherein Z and Y are integers of at least 6, the molar ratio of Z to Y is in the range from 1.0 to 0.5, and x is an integer from 6 to 189 such that the moisture content is from about 4% to about 20% by weight (termed herein, 'partially hydrated'). This water content provides the best rheological properties in the liquid. Above this level (e.g. up to about 28% by weight water content), the water level can lead to network formation. In conventional dispersions, below this level (e.g. from 0 to about 6% by weight water content), trapped gas in pores of the material can be displaced, which causes gassing and tends to lead to a viscosity increase also. Gassing is also caused by decomposition of the perborate, probably catalysed by the zeolite. However, this is inhibited by use of the metasilicate in accordance with the present invention. Also, the anhydrous materials (i.e. with 0 to about 6% by weight of water) can be used as structurants. The preferred range of aluminosilicate is from about 12% to about 30% on an anhydrous basis. The aluminosilicate preferably has a particle size of from 0.1 to 100 microns, ideally between 0.1 and 10 microns.

In the compositions of the present invention, the liquid phase can be a liquid surfactant, an organic non-aqueous non-surfactant liquid, or a mixture of such materials. Many of the compositions do contain a surfactant as a dispersed or dissolved solid, or more often, as all or part of said liquid phase. These surfactant compositions are liquid detergent products, e.g. for fabrics washing or hard surface cleaning. However, the wider term 'liquid cleaning product' also includes non-surfactant liquids which are still useful in cleaning, for example non-aqueous bleach products or those in which the liquid phase consists of one or more light, non-surfactant solvents for greasy stain pre-treatment of fabrics prior to washing. Such pre-treatment products can contain solid bleaches, dispersed enzymes and the like.

The solid particles can be maintained in dispersion in the liquid phase (i.e. resist settling, even if not

perfectly) by a number of means. For example, settling may be inhibited purely by virtue of the relative small size of the particles and the relatively high viscosity of the solvent phase. In other words, the particles settle very slowly at a rate predicted by Stokes' law or due to the formation of a loosely aggregated network of particle flocs. This effect is utilised in the compositions described in patent specifications EP-A-30 096 and GB 2 158 838A. However, there have also been several prior proposals to utilise additional means to enhance solid-suspending properties in such non-aqueous liquids. These are somewhat analogous to so-called external structuring techniques used in aqueous systems; i.e., in addition to the particulate solids and the liquid phase in which they are to be suspended, an additional dispersant is used which by one means or another, acts to aid stable dispersion or suspension of the solids for a finite period. Any of these means may be employed in the compositions according to the present invention.

One such suitable stabilisation involves use of nonionic surfactant as the solvent and to add an inorganic carrier material as the dispersant, in particular highly voluminous silica. This acts by forming a solid-suspending network. This silica is highly voluminous by virtue of having an extremely small particle size, hence high surface area. This is described in GB patent specifications 1,205,711 (Unilever) and 1,270,040 (Unilever). However, there can be a problem with these compositions of setting upon prolonged storage.

A similar suitable structuring can be effected using fine particulate chain structure-type clay, as described in specification EP-A-34,387 (Procter & Gamble).

Another appropriate known use of a substance as a dispersant for particles in nonionic-based non-aqueous compositions entails incorporating a hydrolyzable co-polymer of maleic anhydride with ethylene or vinylmethylether, which co-polymer is at least 30% hydrolyzed. This is described in specification EP-A-28,849 (Unilever). However, a problem with these compositions can be the difficulty in controlling manufacture to obtain reproducible product stability.

Another appropriate means by which such dispersions have been stabilised is the use of a dispersant material which has been termed 'a deflocculant', according to the disclosure of European Patent Specification EP-A-266 199 (Unilever). Particularly preferred deflocculants are alkyl (especially dodecyl) benzene sulphonic acids (as the free acid) and lecithin.

All compositions according to the present invention are liquid cleaning products. They may be formulated in a very wide range of specific forms, according to the intended use. They may be formulated as cleaners for hard surfaces (with or without abrasive) or as agents for warewashing (cleaning of dishes, cutlery etc) either by hand or mechanical means, as well as in the form of specialised cleaning products, such as for surgical apparatus or artificial dentures. They may also be formulated as agents for washing and/or condition-

ing of fabrics.

In the case of hard-surface cleaning, the compositions may be formulated as main cleaning agents, or pre-treatment products to be sprayed or wiped on prior to removal, e.g. by wiping off or as part of a main cleaning operation.

In the case of warewashing, the compositions may also be the main cleaning agent or a pre-treatment product, e.g. applied by spray or used for soaking utensils in an aqueous solution and/or suspension thereof.

Those products which are formulated for the cleaning and/or conditioning of fabrics constitute an especially preferred form of the present invention. These compositions may for example, be of the kind used for pre-treatment of fabrics (e.g. for spot stain removal) with the composition neat or diluted, before they are rinsed and/or subjected to a main wash. The compositions may also be formulated as main wash products, being dissolved and/or dispersed in the water with which the fabrics are contacted. In that case, the composition may be the sole cleaning agent or an adjunct to another wash product. Within the context of the present invention, the term 'cleaning product' also embraces compositions of the kind used as fabric conditioners (including fabric softeners) which are only added in the rinse water (sometimes referred to as 'rinse conditioners').

Thus, the compositions will contain at least one agent which promotes the cleaning and/or conditioning of the article(s) in question, selected according to the intended application. Usually, this agent will be selected from surfactants, enzymes, bleaches, microbiocides, (for fabrics) fabric softening agents and (in the case of hard surface cleaning) abrasives. Of course in many cases, more than one of these agents will be present, as well as other ingredients commonly used in the relevant product form.

The compositions will be substantially free from agents which are detrimental to the article(s) to be treated. For example, they will be substantially free from pigments or dyes, although of course they may contain small amounts of those dyes (colourants) of the kind often used to impart a pleasing colour to liquid cleaning products, as well as fluorescers, bluing agents and the like.

All ingredients before incorporation will either be liquid, in which case, in the composition they will constitute all or part of the liquid phase, or they will be solids, in which case, in the composition they will either be dispersed as deflocculated particles in the liquid phase or they will be dissolved in the liquid phase. Thus as used herein, the term "solids" is to be construed as referring to materials in the solid phase which are added to the composition and are dispersed therein in solid form, those solids which dissolve in the liquid phase and those in the liquid phase which solidify (undergo a phase change) in the composition, wherein they are then dispersed.

If a deflocculant is incorporated, some liquids are alone, unlikely to be suitable to perform the function of liquid phase for any combination of solids and dispersant/deflocculant. However, they will be able

to be incorporated if used with another liquid which does have the required properties, the only requirement being that where the liquid phase comprises two or more liquids, they are miscible when in the total composition or one can be dispersible in the other, in the form of fine droplets.

Thus, where surfactants are solids, they will usually be dissolved or dispersed in the liquid phase. Where they are liquids, they will usually constitute all or part of the liquid phase. Also, some surfactants are eminently suitable as deflocculants.

In general however, surfactants may be chosen from any of the classes, sub-classes and specific materials described in 'Surface Active Agents' Vol. I, by Schwartz & Perry, Interscience 1949 and 'Surface Active Agents' Vol. II by Schwartz, Perry & Berch (Interscience 1958), in the current edition of "McCutcheon's Emulsifiers & Detergents" published by the McCutcheon division of Manufacturing Confectioners Company or in 'Tensid-Taschenbuch', H. Stache, 2nd Edn., Carl Hanser Verlag, München & Wien, 1981.

Liquid surfactants are an especially preferred class of material to use in the liquid phase, especially polyalkoxylated types and in particular polyalkoxylated nonionic surfactants.

As a general rule, the applicants have found that the most suitable liquids to choose as the liquid phase are organic materials having polar molecules. In particular, those comprising a relatively lipophilic part and a relatively hydrophilic part, especially a hydrophilic part rich in electron lone pairs, tend to be well suited. This is completely in accordance with the observation that liquid surfactants, especially polyalkoxylated nonionics, are one preferred class of liquid.

Nonionic detergent surfactants are well-known in the art. They normally consist of a water-solubilizing polyalkoxylene or a mono- or di-alkanolamide group in chemical combination with an organic hydrophobic group derived, for example, from alkylphenols in which the alkyl group contains from about 6 to about 12 carbon atoms, dialkylphenols in which each alkyl group contains from 6 to 12 carbon atoms, primary, secondary or tertiary aliphatic alcohols (or alkyl-capped derivatives thereof), preferably having from 8 to 20 carbon atoms, monocarboxylic acids having from 10 to about 24 carbon atoms in the alkyl group and polyoxypropylenes. Also common are fatty acid mono- and dialkanolamides in which the alkyl group of the fatty acid radical contains from 10 to about 20 carbon atoms and the alkyl group having from 1 to 3 carbon atoms. In any of the mono- and di-alkanolamide derivatives, optionally, there may be a polyoxyalkylene moiety joining the latter groups and the hydrophobic part of the molecule. In all polyalkoxylene containing surfactants, the polyalkoxylene moiety preferably consists of from 2 to 20 groups of ethylene oxide or of ethylene oxide and propylene oxide groups. Amongst the latter class, particularly preferred are those described in European specification EP-A-225,654 (Unilever), especially for use as all or part of the solvent. Also preferred are those ethoxylated nonionics which are the condensation products of fatty alcohols with

from 9 to 15 carbon atoms condensed with from 3 to 11 moles of ethylene oxide. Examples of these are the condensation products of C₁₁₋₁₃ alcohols with (say) 3 or 7 moles of ethylene oxide. These may be used as the sole nonionic surfactants or in combination with those of the described in the last-mentioned European specification, especially as all or part of the liquid phase.

Another class of suitable nonionics comprise the alkyl polysaccharides (polyglycosides/oligosaccharides) such as described in any of specifications US 3,640,998; US 3,346,558; US 4,223,129; EP-A-92,355; EP-A-99,183; EP-A-70,074, '75, '76, '77; EP-A-75,994, '95, '96.

Nonionic detergent surfactants normally have molecular weights of from about 300 to about 11,000. Mixtures of different nonionic detergent surfactants may also be used, provided the mixture is liquid at room temperature. Mixtures of nonionic detergent surfactants with other detergent surfactants such as anionic, cationic or ampholytic detergent surfactants and soaps may also be used. If such mixtures are used, the mixture must be liquid at room temperature.

Examples of suitable anionic detergent surfactants are alkali metal, ammonium or alkylolamine salts of alkylbenzene sulphonates having from 10 to 18 carbon atoms in the alkyl group, alkyl and alkylether sulphates having from 10 to 24 carbon atoms in the alkyl group, the alkylether sulphates having from 1 to 5 ethylene oxide groups, olefin sulphonates prepared by sulphonation of C₁₀-C₂₄ alpha-olefins and subsequent neutralization and hydrolysis of the sulphonation reaction product.

Other surfactants which may be used include alkali metal soaps of a fatty acid, preferably one containing 12 to 18 carbon atoms. Typical such acids are oleic acid, ricinoleic acid and fatty acids derived from castor oil, rapeseed oil, groundnut oil, coconut oil, palmkernel oil or mixtures thereof. The sodium or potassium soaps of these acids can be used. As well as fulfilling the role of surfactants, soaps can act as detergency builders or fabric conditioners, other examples of which will be described in more detail hereinbelow. It can also be remarked that the oils mentioned in this paragraph may themselves constitute all or part of the liquid phase, whilst the corresponding low molecular weight fatty acids (triglycerides) can be dispersed as solids or function as structurants.

Yet again, it is also possible to utilise cationic, zwitterionic and amphoteric surfactants such as referred to in the general surfactant texts referred to hereinbefore. Examples of cationic detergent surfactants are aliphatic or aromatic alkyl-di(alkyl) ammonium halides and examples of soaps are the alkali metal salts of C₁₂-C₂₄ fatty acids. Ampholytic detergent surfactants are e.g. the sulphobetaines. Combinations of surfactants from within the same, or from different classes may be employed to advantage for optimising structuring and/or cleaning performance.

Non-surfactants which are suitable as solvents include those having the preferred molecular forms referred to above although other kinds may be used,

especially if combined with those of the former, more preferred types. In general, the non-surfactant solvents can be used alone or with in combination with liquid surfactants. Non-surfactant solvents which have molecular structures which fall into the former, more preferred category include ethers, polyethers, alkylamines and fatty amines, (especially di- and tri-alkyl- and/or fatty- N-substituted amines), alkyl (or fatty) amides and mono- and di-N-alkyl substituted derivatives thereof, alkyl (or fatty) carboxylic acid lower alkyl esters, ketones, aldehydes, and glycerides. Specific examples include respectively, di-alkyl ethers, polyethylene glycols, alkyl ketones (such as acetone) and glyceryl trialkylcarboxylates (such as glyceryl triacetate), glycerol, propylene glycol, and sorbitol.

In deflocculated systems, many light solvents with little or no hydrophilic character are usually unsuitable on their own (i.e. deflocculation will not occur in them). Examples of these are lower alcohols, such as ethanol, or higher alcohols, such as dodecanol, as well as alkanes and olefins. However, they can be combined with other liquid materials which are surfactants or non-surfactants having the aforementioned 'preferred' kinds of molecular structure.

Preferably, the compositions of the invention contain the organic liquid phase (whether or not comprising liquid surfactant) in an amount of at least 10% by weight of the total composition. The amount of the solvent present in the composition may be as high as about 90%, but in most cases the practical amount will lie between 20 and 70% and preferably between 20 and 50% by weight of the composition.

Preferably also, the compositions of the present invention contain a deflocculant (as hereinbefore defined) which may be any of those referred to in the published prior art, most preferably any described in EP-A-266 199, provided the deflocculant is not a bleach precursor.

The level of any deflocculant material in the composition can be optimised by the means described in the art but in very many cases is at least 0.01%, usually 0.1% and preferably at least 1% by weight, and may be as high as 15% by weight. For most practical purposes, the amount ranges from 2-12%, preferably from 4-10% by weight, based on the final composition.

The compositions according to the present invention preferably also contain one or more other functional ingredients, for example selected from other detergency builders, bleaches and (for hard surface cleaners) abrasives.

Detergency builders are those materials which counteract the effects of calcium, or other ion, water hardness, either by precipitation or by an ion sequestering effect. They comprise both inorganic and organic builders. They may also be sub-divided into the phosphorus-containing and non-phosphorus types.

In addition to aluminosilicates, the class of inorganic builders comprises various phosphate, carbonate, silicate and borate materials, particularly the alkali-metal salt forms. Mixtures of these may also be used.

Examples of phosphorus-containing inorganic

builders include the water-soluble salts, especially alkali metal pyrophosphates, orthophosphates, polyphosphates and phosphonates. Specific examples of inorganic phosphate builders include sodium and potassium phosphates and hexametaphosphates, as well as potassium tripolyphosphate.

Examples of non-phosphorus-containing inorganic builders, when include water-soluble alkali metal carbonates, bicarbonates, borates, and other silicates. Specific examples include sodium carbonate (with or without calcite seeds), potassium carbonate, sodium and potassium bicarbonates.

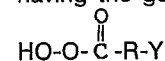
Examples of organic builders include the alkali metal, ammonium and substituted, citrates, succinates, malonates, fatty acid sulphonates, carboxymethoxy succinates, ammonium polyacetates, carboxylates, polycarboxylates, aminopolycarboxylates, polyacetyl carboxylates and polyhydroxysulphonates. Specific examples include sodium, potassium, lithium, ammonium and substituted ammonium salts of ethylenediaminetetraacetic acid, nitrilotriacetic acid, oxydisuccinic acid, melitic acid, benzene polycarboxylic acids and citric acid. Other examples are organic phosphonate type sequestering agents such as those sold by Monsanto under the tradename of the Dequest range and alkanedihydroxy phosphonates.

Other suitable organic builders include the higher molecular weight polymers and co-polymers known to have builder properties, for example appropriate polyacrylic acid, polymaleic acid and polyacrylic/polymaleic acid co-polymers and their salts, such as those sold by BASF under the Sokalan Trade Mark.

Suitable bleaches include the halogen, particularly chlorine bleaches such as are provided in the form of alkalimetal hypohalites, e.g. hypochlorites. In the application of fabrics washing, the oxygen bleaches are preferred, for example in the form of an inorganic persalt, or a peroxy acid compound.

Typical examples of the suitable persalt bleach, compounds are alkalimetal perborates, both tetrahydrates and monohydrates, alkali metal percarbonates, persilicates and perphosphates, of which sodium perborate is preferred.

The organic peroxyacid compound bleaches are preferably those which are solid at room temperature and most preferably should have a melting point of at least 50°C. Most commonly, they are the organic peroxyacids and water-soluble salts thereof having the general formula



wherein R is an alkylene or substituted alkylene group containing 1 to 20 carbon atoms or an arylene group containing from 6 to 8 carbon atoms, and Y is hydrogen, halogen, alkyl, aryl or any group which provides an anionic moiety in aqueous solution.

Another preferred class of peroxygen compounds which can be incorporated to enhance dispensing/dispersibility in water are the anhydrous perborates described for that purpose in the applicants' European patent specification EP-A-217,454.

The preferred level of persalt bleach in the compositions of the invention is from 5% to 35% by weight, most preferably from 10% to 25% by weight.

When the composition contains abrasives for hard surface cleaning (i.e. is a liquid abrasive cleaner), these will inevitably be incorporated as particulate solids. They may be those of the kind which are water insoluble, for example calcite. Suitable materials of this kind are disclosed in the applicants' patent specifications EP-A-50,887; EP-A-80,221; EP-A-140,452; EP-A-214,540 and EP 9,942, which relate to such abrasives when suspended in aqueous media. Water soluble abrasives may also be used.

The compositions of the invention optionally may also contain one or more minor ingredients such as fabric conditioning agents, enzymes, perfumes (including deoperfumes), micro-biocides, colouring agents, fluoescers, soil-suspending agents (anti-re-deposition agents), corrosion inhibitors, enzyme stabilizing agents, and lather depressants.

In general, the solids content of the product may be within a very wide range, for example from 1-90%, usually from 10-80% and preferably from 15-70%, especially 15-50% by weight of the final composition. The components of the solid phase should be in particulate form and have an average particle size of less than 300 microns, preferably less than 200 microns, more preferably less than 100 microns, especially less than 10 microns. The particle size may even be of sub-micron size. The proper particle size can be obtained by using materials of the appropriate size or by milling the total product in a suitable milling apparatus.

The compositions are substantially non-aqueous, i.e. they little or no free water, preferably no more than 5%, preferably less than 3%, especially less than 1% by weight of the total composition. It has been found by the applicants that the higher the water content, the more likely it is for the viscosity to be too high, or even for setting to occur. However, this may at least in part be overcome by use of deflocculants, especially in relatively high amounts.

Since the objective of a non-aqueous liquid will generally be to enable the formulator to avoid the negative influence of water on the components, e.g. causing incompatibility of functional ingredients, it is clearly necessary to avoid the accidental or deliberate addition of water to the product at any stage in its life. For this reason, special precautions are necessary in manufacturing procedures and pack designs for use by the consumer.

Thus during manufacture, it is preferred that all raw materials should be dry and (in the case of hydratable salts) in a low hydration state, e.g. anhydrous phosphate builder, sodium perborate monohydrate and dry calcite abrasive, where these are employed in the composition. In a preferred process, the dry, substantially anhydrous solids are blended with the liquid phase in a dry vessel. In order to minimise the rate of sedimentation of the solids, this blend is passed through a grinding mill or a combination of mills, e.g. a colloid mill, a corundum disc mill, a horizontal or vertical agitated ball mill, to achieve a particle size of 0.1 to 100 microns, preferably 0.5 to 50 microns, ideally 1 to 10 microns. A preferred combination of such mills is a colloid mill followed by a horizontal ball mill since these can be operated under the conditions required to provide a

narrow size distribution in the final product. Of course particulate material already having the desired particle size need not be subjected to this procedure and if desired, can be incorporated during a later stage of processing.

During this milling procedure, the energy input results in a temperature rise in the product and the liberation of air entrapped in or between the particles of the solid ingredients. It is therefore highly desirable to mix any heat sensitive ingredients into the product after the milling stage and a subsequent cooling step. It may also be desirable to de-aerate the product before addition of these (usually minor) ingredients and optionally, at any other stage of the process. Typical ingredients which might be added at this stage are perfumes and enzymes, but might also include highly temperature sensitive bleach components or volatile solvent components which may be desirable in the final composition. However, it is especially preferred that volatile material be introduced after any step of aeration. Suitable equipment for cooling (e.g. heat exchangers) and de-aeration will be known to those skilled in the art.

It follows that all equipment used in this process should be completely dry, special care being taken after any cleaning operations. The same is true for subsequent storage and packing equipment.

The present invention will now be illustrated by way of the following Examples.

EXAMPLE 1

A control non-aqueous dispersion (A) of 24% hydrated (18% H₂O) Zeolite A4 and 15% sodium perborate monohydrate was prepared in nonionic surfactant (Plurafac RA30 -C₁₃₋₁₅ fatty alcohol condensed with 4-5 moles ethylene oxide and 2-3 moles of propylene oxide). All percentages herein are by weight unless stated to the contrary.

Three identical compositions (B) according to the invention was prepared as composition (A) but with 5% by weight sodium metasilicate in place of an equivalent weight of the nonionic.

The gas evolution was measured as the cumulative volume released from 100g of product, after 1 day and 3 days. For the 3 compositions (B), the results were averaged.

Composition	gas evolved ml/100g after	
	1 day	3 days
(A)	17.0	27
(B) av.	10.2	11.4

EXAMPLE 2

The procedure of Example 1 was followed except that various alkaline materials were incorporated and the compositions consisted of:

Zeolite	24%
Sodium perborate monohydrate	15%
Plurafax RA30	56%
Alkaline material	5%

Claims

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The results obtained were as follows:

<u>Alkaline material</u>	<u>Gas evolved ml/100g after</u>		
	<u>1 day</u>	<u>3 days</u>	
None*	17	27	
Sodium tripolyphosphate	18.5	26	15
Sodium carbonate	15	26	
0.5% Potassium hydroxide*	0	20	20
Sodium metasilicate	11.5	11.5	25

* balance made up by further nonionic surfactant.

These results show that the metasilicate was more capable of reducing the gas evolved after 1 day than any other alkaline material, with the exception of potassium hydroxide. After 3 days no further gas evolution had occurred in the metasilicate containing composition whereas all the other compositions had evolved further gas, even that containing the potassium hydroxide.

1. A substantially non-aqueous liquid cleaning composition comprising solid particles of aluminosilicate builder dispersed in a liquid phase, said composition also comprising an alkalimetal metasilicate and being substantially free of bleach precursor.

2. A composition according to claim 1, wherein the alkalimetal metasilicate is sodium metasilicate.

3. A composition according to claim 1, comprising from 1% to 10% by weight of the alkalimetal metasilicate.

4. A composition according to claim 1, further comprising an inorganic persalt bleach.

5. A composition according to claim 1, further comprising a deflocculant.

6. A composition according to claim 1, comprising: from 20% to 50% by weight of a liquid nonionic surfactant; from 12% to 30% by weight of an aluminosilicate builder; from 10% to 25% by weight of an inorganic persalt bleach; from 0.1% to 15% by weight of an alkyl benzene sulphonic acid; and from 1% to 10% by weight of sodium metasilicate.

EXAMPLE 3

The following composition was prepared and the perborate therein was found to be acceptable stable on storage.

<u>Ingredient</u>	<u>% by wt</u>	
Plurafac RA30	42.95	45
ABSA ¹	0.25	
Sodium metasilicate	5.50	
Partially hydrated zeolite	24.00	50
Polymer CP5 ²	6.00	
Sodium carboxymethyl cellulose	1.00	
Sodium perborate monohydrate	15.00	55
Sodium carbonate (anhydrous)	4.00	
Minors	1.30	
<u>Notes</u>		60

1 - Dodecyl benzene sulphonic acid in the free acid form.

2 - Sokalan CP5 which is the sodium salt of a maleic acid/acrylic acid copolymer, ex BASF.