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(54) **Aqueous liquid cleaning compositions**

(57) The invention concerns aqueous liquid hard surface cleaning compositions comprising a surfactant or surfactant mixture, of which at least 20% consists of zwitterionic betaine, and a foam reducing system comprising fatty acid and hydrocarbon solvent

The invention further concerns a process for cleaning hard surfaces comprising applying the composition to the surface and concerns wet ready-to-use cleaning wipes comprising the compositions.

EP 1 607 472 A1

Description**Technical field**

5 **[0001]** The present invention relates to aqueous liquid cleaning compositions. More particularly the invention relates to such compositions that are low foaming or of which the foam disappears quickly.

Background and prior art

10 **[0002]** Liquid cleaning compositions are well known in the art and are available in a wide variety of forms and formulations. They are the compositions of choice for cleaning hard surfaces, but may also be used for cleaning soft surfaces such as carpets, or laundry. They have in common that they generally contain a surfactant or surfactant mixture that usually comprises a sulphate or sulphonate anionic surfactant and/or a nonionic surfactant. Among the nonionic surfactants the ethoxylated aliphatic alcohols are clearly dominant. The anionic surfactants have good cleaning properties, whereas the nonionic surfactants have very good cleaning properties, but have a tendency to damage delicate polymeric surfaces.

[0003] Other kinds of surfactants than the two groups mentioned above are used less frequently and, if used, often in relatively minor proportions compared to the anionic and nonionic surfactants mentioned above.

20 **[0004]** Specialist hard surface cleaning compositions such as hand dishwash compositions often contain amphoteric and/or zwitterionic surfactants, such as betaines, and specialist nonionic surfactants such as alkyl polyglycosides. Such surfactants generate rich foam. For hand dishwash purposes rich foam is desirable as it is perceived by consumers as signalling cleaning power, particularly for fatty soil, and conversely the disappearance of foam signals that the washing up liquid does not sufficiently clean any more.

25 **[0005]** However, for other surface cleaning tasks than hand dishwash the consumer does not consider a large amount of foam staying on the cleaned surface to be an advantage, because it is perceived as a sign that too much cleaning liquid is still present and that the surface needs to be rinsed. This is another reason for using ethoxylated nonionic surfactants in such compositions because they are generally low foaming.

[0006] Betaines are used on a large scale in shampoos and body wash compositions because of their good cleaning properties and their ability to generate profuse foam.

30 **[0007]** WO 99/63033 describes cleaning compositions comprising ethoxylated nonionic surfactants as a primary surfactant, preferably in an amount of 0.5-20%, and zwitterionic betaine surfactant as a secondary surfactant, preferably in an amount of 0.01-10%. Generally the surfactant mixture in these compositions consists for 50% or more of ethoxylated nonionic surfactant. Furthermore, these compositions comprise as essential components peroxide bleach, e.g. hydrogen peroxide, and a sulphonated hydrotrope such as a toluene-, xylene- or cumene-sulphonic acid salt. They preferably comprise as a foam reducing agent a mixture of fatty acid and capped alkoxyated nonionic surfactant. They are useful for stain removal and bleaching of laundry and hard surfaces. These compositions have the disadvantage that the hydrotrope, which is required for stability reasons, adds raw material cost to the composition without contributing to the cleaning power.

40 **[0008]** WO9918181 describes cleaning compositions having pH below 7, comprising hydrogen peroxide, a mixture of alkoxyated nonionic and betaine and/or amine oxide surfactants and a foam reducing system comprising fatty acid with capped alkoxyated nonionic surfactant and/or silicone antifoam. The foam reducing system is said to produce synergistic foam reduction, but this is not in any way shown or exemplified.

45 **[0009]** EP080749 describes a combination of diethylene glycol monobutyl ether (butyl carbitol) and mono- or sesquiterpenes as essential ingredients in a system for foam control in liquid cleaning compositions, preferably in combination with a fatty acid soap. The compositions should contain at least 0.5%, but preferably at least 2% terpene and at least 0.5% of butyl carbitol and preferably 0.05-2% soap while 0.3% and 0.45% are exemplified.

50 **[0010]** WO9318128 describes foam control systems for liquid cleaning compositions comprising saturated hydrocarbon and fatty acid or fatty acid soap. The amount of hydrocarbon is specified to be 0.2-10%, but preferably at least 0.5%. The amount of fatty acid is specified to be at least 0.2%, but from the examples it is clear that only 0.4% or more produces measurable foam reduction. Furthermore, although the system is supposed to be suitable for compositions without a glycolether solvent, the compositions preferably contain 5% of such solvents.

[0011] There still is a need for liquid cleaning compositions that combine excellent cleaning with low damage on delicate surfaces and low foaming, also without the use of glycolether solvents.

Summary of the invention

[0012] It has now been found that aqueous liquid cleaning compositions comprising zwitterionic betaine surfactant and optionally non-capped alkoxyated alcohol nonionic surfactant give excellent cleaning, even at low surfactant con-

centrations. They can be safely used on delicate polymer surfaces and they can be made low foaming by a combination of low amounts of fatty acid and hydrocarbon solvent.

[0013] Thus, the invention provides aqueous liquid cleaning compositions comprising a zwitterionic betaine surfactant and optionally a non-capped alkoxyated alcohol nonionic surfactant and a foam reducing system comprising a fatty acid and a hydrocarbon solvent.

[0014] Furthermore, the invention provides a process for cleaning hard surfaces comprising the step of applying to the surface a cleaning composition comprising a zwitterionic betaine surfactant and optionally a non-capped alkoxyated alcohol nonionic surfactant and a foam reducing system comprising a fatty acid and a hydrocarbon solvent, or a dilute solution of such composition.

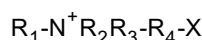
[0015] Additionally the invention provides ready-to-use premoistened (wet) wipes comprising a composition as described above.

Detailed description of the invention

[0016] All percentages mentioned herein are by weight unless specified otherwise.

[0017] The cleaning compositions according to the invention comprise a surfactant or surfactant mixture and a foam reducing system and are characterised in that:

i) 0.1-10% of the total composition consists of the surfactant or surfactant mixture of which at least 20% consists of one or more zwitterionic betaines of the general formula:



wherein:

- R_1 is an aliphatic, saturated or unsaturated, linear or branched hydrocarbon chain containing 8-20 carbon atoms or a group of the formula $R_5-CO-NH-(CH_2)_x$ wherein R_5 is an aliphatic, saturated or unsaturated, linear or branched hydrocarbon chain containing 8-20 carbon atoms and x is an integer from 2 to 4;
- R_2 is hydrogen or C_1-C_3 alkyl;
- R_3 is C_1-C_3 alkyl;
- R_4 is a linear alkylene group of up to 6 carbon atoms;
- X is a carboxylate or sulphonate group;

ii) the composition comprises a foam reducing system comprising a fatty acid and a hydrocarbon solvent.

[0018] Preferably R_1 is an aliphatic, saturated or unsaturated, linear or branched hydrocarbon chain, more preferably it contains up to 16 carbon atoms, most preferably 10-14 carbon atoms.

Preferably R_2 and R_3 are both methyl.

Preferably R_4 has 1-3 carbon atoms, most preferably R_4 is methylene.

Preferably X is a carboxylate group.

[0019] Preferably the total amount of surfactant in the composition is 0.5-5%, more preferably it is 1-4%.

[0020] Preferably at least 25% of total surfactant in the composition is zwitterionic betaine, more preferably at least 30% or even 50%. In one advantageous embodiment of the invention the surfactant is the composition consists exclusively of zwitterionic betaine.

[0021] Other surfactants may be used in the compositions in addition to the betaine surfactants. They can be chosen from a wide range of anionic, nonionic, cationic and amphoteric surfactants.

[0022] A suitable class of anionic surfactants are water-soluble salts of organic sulphuric acid mono-esters and sulphonic acids having in the molecular structure a branched or straight chain alkyl group containing 8-22 C atoms or an alkylaryl group containing 6-20 C atoms in the alkyl part.

[0023] Examples of such anionic surfactants are water-soluble salts of:

- long chain (i.e. 8-22 C-atom) alcohol sulphates (hereinafter referred to as PAS), especially those obtained by sulphating the fatty alcohols produced from tallow or coconut oil or the synthetic alcohols derived from petroleum;

- alkylbenzene-sulphonates, such as those in which the alkyl group contains from 6 to 20 carbon atoms;
 - secondary alkane sulphonates.
- Also suitable are the salts of:

- alkylglyceryl ether sulphates, especially of the ethers of fatty alcohols derived from tallow and coconut oil;
- fatty acid monoglyceride sulphates;
- sulphates of ethoxylated aliphatic alcohols containing 1-12 ethyleneoxy groups;
- alkylphenol ethyleneoxy-ether sulphates with from 1 to 8 ethyleneoxy units per molecule and in which the alkyl groups contain from 4 to 14 carbon atoms;
- the reaction product of fatty acids esterified with isethionic acid and neutralised with alkali.

[0024] A suitable class of nonionic surfactants can be broadly described as compounds produced by the condensation of simple alkylene oxides, which are hydrophilic in nature, with an aliphatic or alkyl-aromatic hydrophobic compound having a reactive hydrogen atom. The length of the hydrophilic or polyoxyalkylene chain that is attached to any particular hydrophobic group can be readily adjusted to yield a compound having the desired balance between hydrophilic and hydrophobic elements. This enables the choice of nonionic surfactants with the right HLB. Particular examples include:

- the condensation products of aliphatic alcohols having from 8 to 22 carbon atoms in either straight or branched chain configuration with ethylene oxide, such as a coconut alcohol/ethylene oxide condensates having from 2 to 15 moles of ethylene oxide per mole of coconut alcohol;
- condensates of alkylphenols having C6-C15 alkyl groups with 5 to 25 moles of ethylene oxide per mole of alkylphenol;
- condensates of the reaction product of ethylene-diamine and propylene oxide with ethylene oxide, the condensates containing from 40 to 80% of ethyleneoxy groups by weight and having a molecular weight of from 5,000 to 11,000.

[0025] Other classes of nonionic surfactants are:

- alkyl-polyglycosides, which are condensation products of long chain aliphatic alcohols and saccharides;
- tertiary amine oxides of structure RRRN₀, where one R is an alkyl group of 8 to 20 carbon atoms and the other R's are each alkyl or hydroxyalkyl groups of 1 to 3 carbon atoms, e.g. dimethyldodecylamine oxide;
- tertiary phosphine oxides of structure RRRP₀, where one R is an alkyl group of 8 to 20 carbon atoms and the other R's are each alkyl or hydroxyalkyl groups of 1 to 3 carbon atoms, for instance dimethyl-dodecylphosphine oxide;
- dialkyl sulphoxides of structure RRSO where one R is an alkyl group of from 10 to 18 carbon atoms and the other is methyl or ethyl, for instance methyl-tetradecyl sulphoxide;
- fatty acid alkylolamides, such as the ethanol amides;
- alkylene oxide condensates of fatty acid alkylolamides;
- alkyl mercaptans.

[0026] A specific group of surfactants are the tertiary amines obtained by condensation of ethylene and/or propylene oxide with long chain aliphatic amines. The compounds behave like nonionic surfactants in alkaline medium and like cationic surfactants in acid medium.

[0027] Suitable amphoteric surfactants are derivatives of aliphatic secondary and tertiary amines containing an alkyl group of 8 to 20 carbon atoms and an aliphatic group substituted by an anionic water-solubilising group, for instance sodium 3-dodecylamino-propionate, sodium 3-dodecylaminopropane-sulphonate and sodium N-2-hydroxy-dodecyl-N-methyltaurate.

[0028] Examples of suitable cationic surfactants can be found among quaternary ammonium salts having one or two alkyl or aralkyl groups of from 8 to 20 carbon atoms and two or three small aliphatic (e.g. methyl) groups, for instance cetyltrimethylammonium bromide.

[0029] Further examples of suitable surfactants are compounds commonly used as surface-active agents given in the well-known textbooks: "Surface Active Agents" Vol.1, by Schwartz & Perry, Interscience 1949; "Surface Active Agents" Vol.2 by Schwartz, Perry & Berch, Interscience 1958; the current edition of "McCutcheon's Emulsifiers and Detergents" published by Manufacturing Confectioners Company; "Tenside-Taschenbuch", H. Stache, 2nd Edn., Carl Hauser Verlag, 1981.

[0030] Preferred optional surfactants are nonionic surfactants, more particularly alkoxylated nonionic surfactants. Most preferred are the condensation products of aliphatic alcohols having from 8 to 22 carbon atoms in either straight or branched chain configuration with ethylene oxide, particularly 2-15 moles of ethylene oxide. Preferably these alkoxylated alcohols are non-capped i.e. the (poly)ethyleneoxy chain ends with the group: -CH₂CH₂OH.

[0031] As outlined above, the amount of optional surfactant or surfactants is at most 80%, preferably at most 75%,

more preferably at most 70% or even 50% of the total surfactant in the composition.

[0032] The foam reducing system is required to prevent unduly large amounts of foam being produced during the cleaning operation. General purpose hard surface cleaning compositions are preferably low-foaming or produce foam which easily and quickly collapses, thereby eliminating the nuisance to the consumer of having to separately rinse or wipe away the foam.

[0033] It was found that well known antifoam compounds (also known as foam reducing agents) such as capped alkoxylated nonionic surfactants, hydrocarbons and branched chain alkanols as well as fatty acids are in themselves unable to sufficiently reduce foaming of the zwitterionic betaines.

[0034] However, mixtures of a low amount of fatty acid and a low amount of hydrocarbon provide very efficient foam reducing systems.

[0035] For the purposes of this invention fatty acids are defined as monobasic aliphatic carboxylic acids having between 6 and 24 carbon atoms, more preferably 8-20 carbon atoms, even more preferably 10-18 carbon atoms. Suitable fatty acids and fatty acid mixtures are commercially available, e.g. under the brand name "Prifac" from Uniqema, Gouda, The Netherlands. For the purposes of this invention good water-soluble fatty acids salts are comprised in the definition of fatty acid. Such salts particularly include alkalimetal, ammonium and amine salts.

[0036] Also for the purposes of this invention hydrocarbons are defined as aliphatic, alicyclic, araliphatic or aromatic compounds, or mixtures of such compounds, comprising only hydrogen and carbon atoms and having a boiling point, or boiling range, above 100°C. They preferably have a low odour or no odour and contain no other unsaturation than aromatic rings. Preferred hydrocarbons have boiling points between 120 and 350°C, more preferably between 150 and 300°C. More preferred are saturated aliphatic or alicyclic hydrocarbons. Suitable hydrocarbons can be found among terpenoids and paraffins. Paraffins are particularly suitable because of their low odour and are commercially available e.g. under the brand names "Isopar" from Exxon Mobile Corp and Shellsol from Shell Chemical Co.

[0037] The amount to be used of each of these two components of the foam reducing system is dependent on the amount of surfactant and particularly the amount of betaine in the cleaning composition. In general an amount of 0.05% of fatty acid and 0.05% of hydrocarbon will be required to provide antifoam activity at low betaine concentration e.g. below 1%. Preferably an amount of at least 0.10% fatty acid and 0.05% hydrocarbon is used to provide effective foam reduction activity over a wide range of betaine concentrations. More preferably the amount of fatty acid is at least 0.12%, even more preferably at least 0.15%. Also more preferably the amount of hydrocarbon is at least 0.07%, even more preferably at least 0.10% or even 0.15%. The ratio of fatty acid to hydrocarbon is preferably kept between 1:5 and 5:1, more preferably between 1:2 and 3:1. In general an amount of more than 1% of each does not provide any additional foam reduction benefit and preferably the amounts are kept below 0.5% for each of fatty acid and hydrocarbon, more preferably, at or below 0.3% or even below 0.25%.

[0038] The foam reducing system described above provides desired foam reduction in neat use of the cleaning compositions as well as when diluted with tap water as is generally used for cleaning large surfaces.

Optional components

[0039] In addition to the essential betaine surfactant, the optional other surfactants and the essential foam reducing system described above, the compositions according to the invention may contain other components which are in themselves common ingredients for liquid cleaning compositions.

[0040] One common ingredient is a polymeric thickening agent. The usual thickening agents known in the art are suitable for the purpose. Examples of such agents are well-known synthetic polymers, particularly poly(meth)acrylates, poly-(maleic acid) or -(maleic anhydride) derivatives, copolymers of these or of any of these with other well-known vinylic monomers. Other examples are well known natural or modified natural polymers such as cellulose derivatives, starch derivatives, natural gums, particularly vegetable and microbial gums. Particularly preferred are polymers that give a clear solution in the aqueous composition, such as xanthan and similar gums e.g. as commercially available under the brand name "Kelzan".

[0041] Polymeric thickening agents are used in amounts required to provide the desired viscosity profile, which is generally dependent upon the envisaged use of the compositions. Amounts of 0.001-5% of the total composition are generally suitable.

[0042] Another common ingredient is a peroxide bleaching agent, with hydrogen peroxide being the most suitable example. Hydrogen peroxide is preferably used in an amount of 0.1-10% of the total composition, more preferably 0.5-5%. When hydrogen peroxide is present a suitable chelating agent for (transition) metals is preferably added as well. Such agents are well known in the art and a large variety of suitable compounds are marketed e.g. by Monsanto under the brand name "Dequest".

[0043] Other optional ingredients include well known builders such as inorganic phosphates, organic phosphonates, polycarboxylates, alkalimetal carbonates, and alkalimetal silicates.

[0044] Still other optional ingredients include organic solvents, which may be hydrophobic solvents and/or hydrophilic

solvents, such as C₁ - C₄ aliphatic alcohols and certain (poly)glycols and (poly)glycol ethers. The aqueous solubility and hydrophilicity of (poly)glycols and (poly)glycol ethers strongly depends on the kind and amount of glycol group(s) and the kind of ether group and the large variety available can all be used in compositions according to the invention, depending on the particular purpose for which a composition will be used. However, (poly)glycol ethers do not contribute to the foam reduction system, and liquid cleaning compositions with less than 5% preferably less than 2% or even without glycol- or polyglycol ethers altogether are preferred embodiments of the present invention.

[0045] Further optional ingredients may include bleach activators, soil suspending agents, radical scavengers and antioxidants (e.g. tannic acid, gallic acid and derivatives, ascorbic acid and derivatives, tocopherols), optical brighteners, UV absorbers, perfumes, pearlescent agents, solid abrasives, other solid particles such as encapsulates containing benefit agents, dyes, pigments, etc.

[0046] Although hydrotropes may be used, they generally do not serve a useful purpose in the compositions according to the invention and therefore are preferably only present in small amounts (e.g. below 0.1% or even 0.01%) if used at all and are preferably omitted entirely. Particularly, sulphonated hydrotropes are preferably absent. Also capped alkoxyated nonionic surfactants generally do not serve a useful purpose in the compositions according to the invention either as surfactant or as antifoam and are therefore preferably present in only small amounts (i.e. below 0.1%, preferably below 0.01% or even below 0.001%) if used at all and more preferably are absent entirely.

[0047] The compositions according to the invention preferably have pH between 1 and 10, more preferably between 2 and 8, most preferably at least 3.

Cleaning process

[0048] As outlined above the invention also provides a process for cleaning hard surfaces comprising the step of applying a composition according to the invention to the surface to be cleaned and removing the soil or dirt present on the surface. To this end the composition is usefully applied to the surface with a wipe or cloth or other suitable implement. Generally a cleaning operation involves applying the composition and removing the soil in one and the same swipe or swipes. Another advantageous way of applying the composition to the surface is as a spray from a bottle fitted with a trigger- or pump-spray or similar device.

[0049] In the process the composition may be applied neat i.e. without previous dilution with water other than water which may be already present in the moist wipe or cloth. Alternatively, and particularly for large surfaces such as floors or walls, the composition may be prediluted with water to obtain a cleaning solution which is thereafter applied to the soiled surface. Suitable dilution factors are between 1 (volume part of composition) to 20 (volume parts of cleaning solution) and 1 to 500, preferably between 1 to 50 and 1 to 300. Due to the low foaming characteristics of the compositions according to the invention such cleaning solutions may be left to dry on the cleaned surface without further rinsing.

Ready-to-use wipes

[0050] In one preferred embodiment of the invention the compositions may be applied to a porous carrier material such as a wipe or sponge to prepare a ready-to-use premoistened (i.e. wet) wipe or sponge which can be used for cleaning without any further addition of water being necessary.

[0051] Wet wipes according to the invention comprise a flexible substrate made of one or more layers of woven or non-woven fibrous material impregnated with a composition according to the invention.

[0052] Suitable substrates for wet wipes are well known in the art and include non-woven material with sufficient wet strength and liquid absorption capacity to contain a suitable amount of the liquid composition according to the invention and deliver it to the surface to be cleaned. The fibres may be from natural sources e.g. viscose or cellulose such as wood pulp or cotton, or synthetic origin such as polypropylene, polyester and nylon. Mixed fibres from different sources may be used in one layer of substrate.

[0053] Optionally, one or more polymeric binders can be added. Any binder material present should not be soluble in the liquid composition to such an extent that it causes the wipe to cause streaking on the cleaned surface.

[0054] The fibres can be formed into webs using technologies generally known in the art such as carding, drylaid, wetlaid, airlaid and extrusion. Webs can be bonded using technologies known in the art such as needlepunch, stitch-bond, hydro-entangling, chemical bonding, thermal bonding, spunbinding, spunlacing and meltblowing. A preferred method is spunlacing.

[0055] The wipe may be a single layer structure or a multilayer structure formed from layers of materials of the above general type, which may be the same or different.

[0056] It is important that the substrate be free from impurities that can be leached out by the liquid composition and can cause streaking on the wiped surface. If necessary, the substrate may be pre-washed prior to impregnation with the composition of the invention in order to remove such impurities.

[0057] Prior to impregnation with the composition of the invention, the wipe typically has an average thickness ranging from 0.1 to 3.0mm, a maximum absorbency of from 1 to 20g/g (grams water per gram of wipe) and a baseweight of from 20 to 100 g/m².

[0058] The wipes are preferably impregnated with at least 0.5g liquid composition per g substrate dry weight, more preferably 1.0-4.0g liquid per g substrate, most preferably 1.0-2.0g liquid per g substrate.

[0059] The wipes according to the invention may also comprise an additional non-fibrous layer of absorbent or liquid-carrying material such as a spongy layer or a layer of super absorbent material that is capable of releasing the liquid again under the application of pressure.

Examples 1-3

[0060] Cleaning compositions were prepared according to the following formulations. Example 1 is according to the invention, examples 2 and 3 are comparative examples containing either fatty acid or hydrocarbon.

	1	2	3
Empigen BB™ *	1.5%	1.5%	1.5%
Neodol 91-5™ **	1.0%	1.0%	1.0%
Prifac 7907™ ***	0.2%	0.2%	-
Isopar L ****	0.2%	-	0.2%
Citric acid/NaOH	 to pH 4		
Demin water	 to 100%		

*) N-dodecyl-N,N-dimethyl-glycine marketed by Albright & Wilson.

**) C₉-C₁₁ 5EO ethoxylated alcohol marketed by Shell Chemical

***) fatty acid mixture marketed by Uniqema.

****) paraffin solvent mixture marketed by Exxon Mobile Corp.

[0061] Test amounts of 1 kg of each of the cleaning compositions were made by weighing the required amounts of Empigen BB, Neodol and about 90% of the required amount of demin water in a glass jar with a magnetic stirrer. To this was added the required amount of Isopar, Prifac or a premix of the two. The mixture was stirred and heated to about 80°C until the solution had cleared, and cooled back to 20°C. The pH was measured and adjusted to pH 4 with citric acid or NaOH, as required. Finally, the weight was made up to 1 kg by the addition of demin water.

[0062] All three compositions provided excellent cleaning in neat as well as dilute use. Foam volume was measured over time for all three compositions under standard conditions described below. The results are presented in Fig 1 and show that whereas neither fatty acid nor hydrocarbon alone produced any appreciable foam reduction for at least 4 minutes, the combination lead to foam collapse starting after about 1.5 minutes to reach about one quarter of the original volume after about 4 minutes.

Foam measurement

[0063] Into a wide mouthed measuring cylinder 3g of the cleaning composition is added and the volume is made up to 250ml with Prenton water (26° French Hardness). The solution is well mixed by giving it a small amount of agitation while taking care that no foam is produced. The top is placed on the cylinder and the solution is allowed to stand for 5 minutes. The cylinder is fully inverted and righted 10 times to produce the foam. Thereafter the top of the cylinder is removed and the amount of foam is noted every 30 seconds from time 0 to 5 minutes.

Examples 4a-e

[0064] Cleaning compositions with varying mixtures of Prifac 7907 fatty acid and Isopar L hydrocarbon were made according to the following formulations, using the procedure described above:

Example	4	a	b	c	d	e
Empigen BB	1.00%					
Neodol 91-5	2.25%					
Perfume	0.33%					
Citric acid/NaOH	to pH 7.5					

(continued)

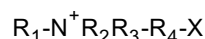
Example	4	a	b	c	d	e
Demin water	to 100%					
Prifac 7907		0.10	0.15	0.20	0.30	0.20
Isopar L		0.10	0.15	0.20	0.30	0.10

[0065] Foam volume was measured over time for all five compositions under standard conditions as described above. The results are presented in Fig 2. They show good foam reduction for all compositions. They also show that for this composition higher amounts than 0.2% of both fatty acid and hydrocarbon give little extra contribution to foam reduction.

Claims

1. Aqueous liquid cleaning compositions comprising a surfactant or surfactant mixture and a foam reducing system **characterised in that:**

i) 0.1-10% of the total composition consists of the surfactant or surfactant mixture of which at least 20% consists of one or more zwitterionic betaines of the general formula:



wherein:

- R_1 is an aliphatic, saturated or unsaturated, linear or branched hydrocarbon chain containing 8-20 carbon atoms or a group of the formula $R_5-CO-NH-(CH_2)_x$ wherein R_5 is an aliphatic, saturated or unsaturated, linear or branched hydrocarbon chain containing 8-20 carbon atoms and x is an integer from 2 to 4;
- R_2 is hydrogen or C_1-C_3 alkyl;
- R_3 is C_1-C_3 alkyl;
- R_4 is a linear alkylene group of up to 6 carbon atoms;
- X is a carboxylate or sulphonate group;

ii) the composition comprises a foam reducing system comprising a fatty acid and a hydrocarbon solvent.

2. Cleaning compositions according to claim 1

characterised in that R_1 is an aliphatic, saturated or unsaturated, linear or branched hydrocarbon chain containing up to 16 carbon atoms.

3. Cleaning compositions according to claims 1 or 2

characterised in that R_2 and R_3 are both methyl.

4. Cleaning compositions according to claims 1-3

characterised in that R_4 has 1-3 carbon atoms and X is a carboxylate group.

5. Cleaning compositions according to claims 1-4 **characterised in that** at least 25% of total surfactant in the composition is zwitterionic betaine.

6. Cleaning compositions according to claims 1-5 **characterised in that** they additionally comprise nonionic surfactant comprising non-capped condensation products of aliphatic alcohols having from 8 to 22 carbon atoms in either straight or branched chain configuration with ethylene oxide.

7. Cleaning compositions according to claims 1-6 **characterised in that** the foam reducing system comprises at least 0.05% fatty acid and 0.05% hydrocarbon

8. Cleaning compositions according to claim 7 **characterised in that** the foam reducing system comprises 0.1-2% fatty acid and 0.1-2% hydrocarbon in a ratio of between 1:5 and 5:1

EP 1 607 472 A1

9. Process for cleaning hard surfaces comprising the step of applying to the hard surface a composition according to any one of claims 1-8

10. Wet ready-to-use cleaning wipes comprising a cleaning composition according to any one of claims 1-8.

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FIG 1

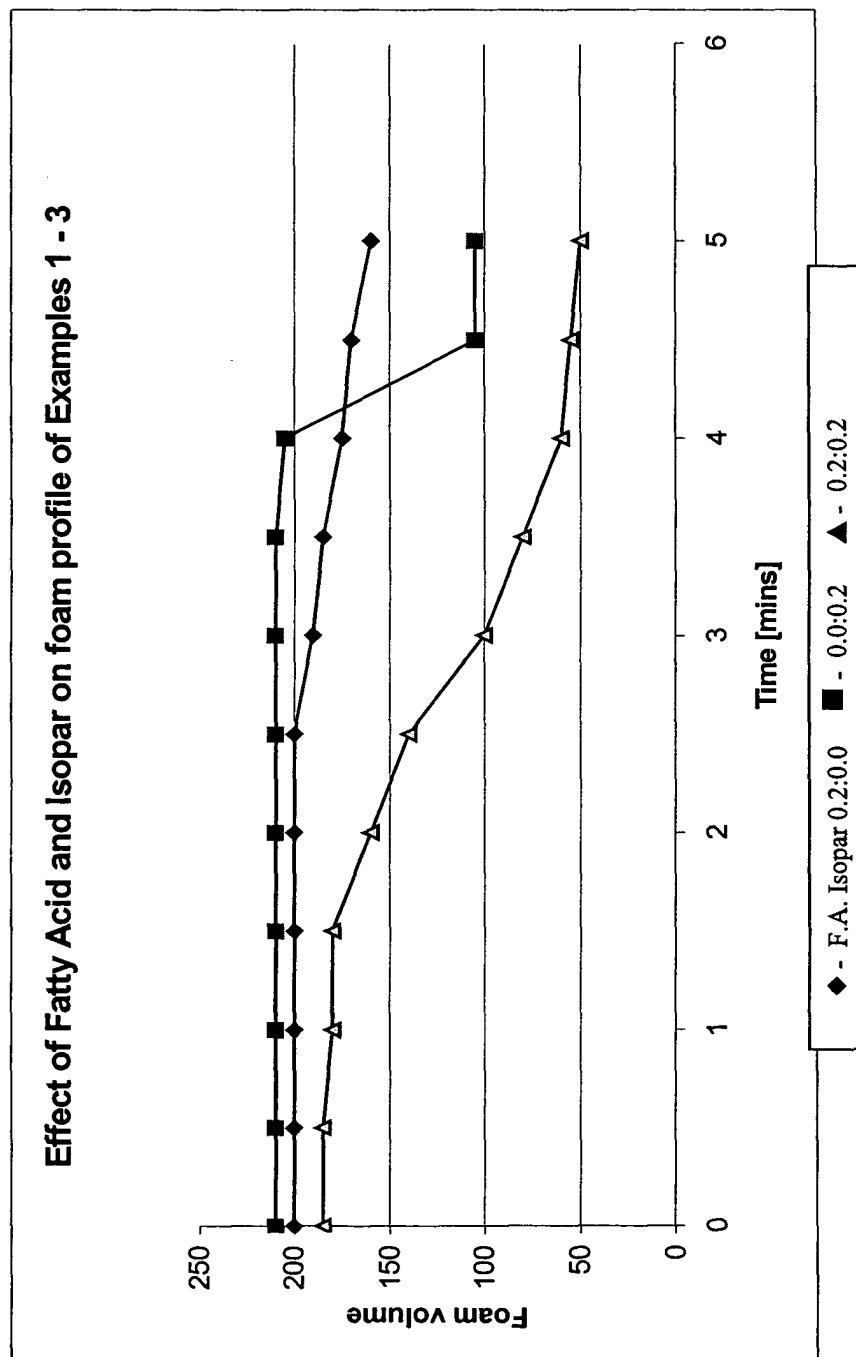
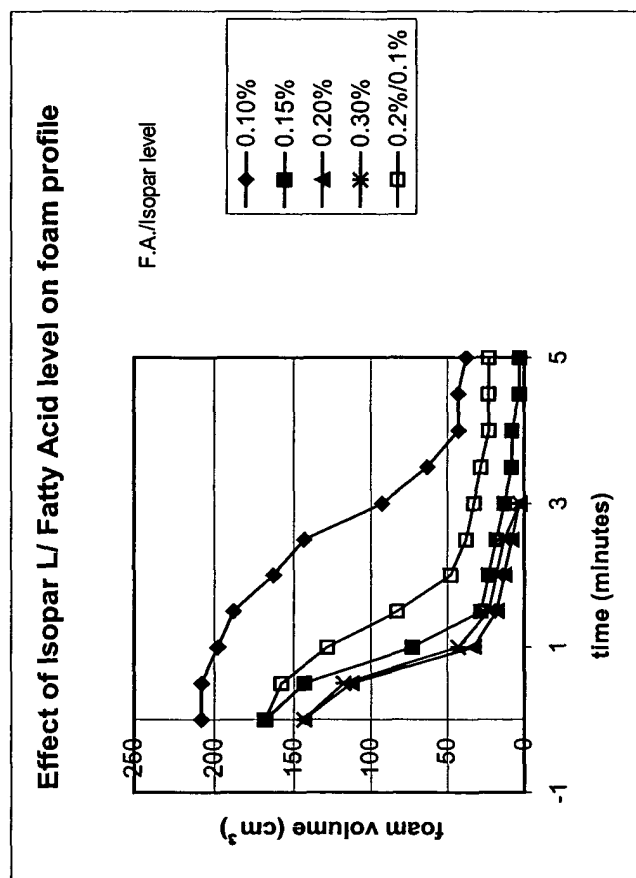


FIG 2





European Patent
Office

EUROPEAN SEARCH REPORT

Application Number
EP 04 25 3646

DOCUMENTS CONSIDERED TO BE RELEVANT			
Category	Citation of document with indication, where appropriate, of relevant passages	Relevant to claim	CLASSIFICATION OF THE APPLICATION (Int.Cl.7)
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