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(54) A FOAMING ACIDIC HARD SURFACE CLEANING COMPOSITION

SCHÄUMENDE REINIGUNGSZUSAMMENSETZUNG FÜR HARTE OBERFLÄCHEN
COMPOSITION MOUSSANTE POUR LE NETTOYAGE DE SURFACE DURE

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(72) Inventors:
• **RAJENDIRAN, Ganesan**
6708 WH Wageningen (NL)
• **SYED, Shah Faisal**
6708 WH Wageningen (NL)
• **THIRUMENI, Dhanalakshmi**
6708 WH Wageningen (NL)

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(74) Representative: **Corsten, Michael Allan**
Unilever Patent Group
Bronland 14
6708 WH Wageningen (NL)

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(73) Proprietors:
• **Unilever IP Holdings B.V.**
6708 WH Wageningen (NL)
Designated Contracting States:
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LI LT LU LV MC ME MK NL NO PL PT RO SE SI SK
SM**
• **Unilever Global IP Limited**
Wirral, Merseyside CH62 4ZD (GB)
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Description**Field of the Invention**

5 **[0001]** The present invention is in the field of acidic hard surface cleaning compositions. More particularly, the present invention relates to a foaming acidic hard surface cleaning composition in liquid form, which provides a stable cleaning foam in use.

Background of the Invention

10 **[0002]** Cleaning hard surfaces such as, kitchen tops, tiles, table-top, cupboards, wash basin and toilet bowls are part of house-hold chores. Often consumers spend considerable amount of time and effort in such cleaning activities. They prefer to use various cleaning products for the same. Cleaning products differ in terms it's constituents, such as, deterative actives, builder, colourants, pH; such products are available in different formats, for example, powder, liquid, bars, tablet, spray and wipe.

15 **[0003]** Often hard surface cleaning products are available in liquid format. Typically, consumers dispense an aliquot of a liquid product on a surface and apply it with an implement, such as, sponge, wipe and brush. It is observed that consumers are comfortable with such practices, particularly on flat, horizontal surfaces, like tabletop, kitchen top. However, they face difficulty in applying the same on vertical surfaces, like bathroom tiles, wash basin and toilet bowls, since the product flows down the surface, which also results in inadequate cleaning performance. Often, consumers tend to dispense excess product for better cleaning. Further, a liquid product fails to reach inaccessible spaces, nook and corners, such as, toilet rim, even with the help of any implement, leaving inefficient cleaning.

20 **[0004]** One way to overcome such issues is to provide products in foam format, where deterative or cleaning actives are available as cleaning foam. Foam is an air-liquid mix, it covers a significantly larger surface area compared to similar dosage of liquid product. Foam clings to a surface and prevents run off, thus reducing the dosage of a product. Further, it retains on the surface leading to increase contact time, thus provides improve cleaning. Moreover, it easily reaches nook and corners of desired surface. However, efficiency of a product in foam format depends on factors, such as, constituents of the composition, bubble size in the foam, foam stability, liquid fraction in the foam and foam retention.

25 **[0005]** It is desired that a cleaning composition in foam format stays on the surface for a longer period providing sufficient contact time and thereby improves cleaning efficacy.

30 **[0006]** Further, hard surfaces, like bathroom tiles, toilet bowls, are likely to have limescale deposits. It is desirable to have a hard surface cleaning composition, which can remove lime scales efficiently along with regular cleaning. One way to achieve this by formulating a composition as an acidic hard surface cleaner having enough acid to react with limescale, thereby remove it.

35 **[0007]** In this context, WO 2017/075681 (Oxiten S.A., 2017) discloses a new thickener composition comprising a mixture of one or more alkoxyated polyol esters, one or more ethoxyated sorbitan esters and glycerol, used to increase the viscosity of cosmetic skin and hair cleansing products and of surface and fabric cleaners, as well as to make these products easier to formulate.

40 **[0008]** EP 3 714 945 A1 (Applechem Inc., 2018) discloses a liquid thickener composition comprising polyalkoxyated polyol polyester having guerbet moieties and compounds contained herein relate to polyalkoxyated polyol polyester having a viscosity allows a product to be poured.

[0009] US 2005/0112081 (Clariant GmbH, 2005) discloses compositions comprising oxyakoylated polyglycerol esters, one or more organic solvents and water.

45 **[0010]** US2008/0207767 (Gojo Industries, 21008) discloses a foamable composition comprising ≥ 40 wt.% C1-4 alcohol and a foaming surfactant chosen from gemini surfactants, sulfuric acid esters, diesters, 10-34C fatty alcohols, polyquaternium and/or polymers.

[0011] WO2006/138111 discloses a composition comprising monohydric alcohol in an amount sufficient to provide antimicrobial activity, surfactant comprising a dimethicone surfactant; and builder in an amount sufficient to provide stability or to improve the stability of a foam formed from the composition.

50 **[0012]** Despite the prior art, there is still need for an improved liquid acidic hard surface cleaning composition which can be dispensed as a stable foam in use.

55 **[0013]** Surprisingly, the present inventors have found that an acidic liquid cleaning composition comprising select surfactant and an alkoxyated polyol polyester with specific structure is dispensed as stable foam in use and the foam stays on a hard surface for a longer period, thereby provides improved cleaning benefit. The composition has shown efficient limescale removal from the surface.

Summary of the Invention

[0014] In a first aspect the present invention provides a foaming hard-surface cleaning composition comprising:

- 5 a) a surfactant selected from cationic surfactant, amphoteric surfactant, nonionic surfactant and combinations thereof;
 b) an alkoxyated polyol polyester comprising at least three alkoxyate chains and at least two C8 to C40 fatty acid esters; and
 10 c) an acid selected from hydrochloride acid, sulphamic acid, tartaric acid, citric acid, malic acid, malonic acid, glycolic acid, maleic, lactic acid and combinations thereof, wherein the composition is free of anionic surfactant and free of C1 to C4 alcohol.

[0015] In another aspect, the present invention provides a concentrated cleaning product for providing a foaming composition on dilution in water comprising a composition according to the first aspect and less than 20 % by weight water.

15 **[0016]** In another aspect, the present invention provides a cleaning product comprising a foam dispenser and a cleaning composition according to the first aspect, wherein the composition is housed in the dispenser.

[0017] In another aspect, the present invention provides a process for cleaning a hard surface comprising steps of:

- 20 a) providing a composition according to the first aspect in a container equipped with a foam trigger;
 b) dispensing the composition as foam; and
 c) optionally rinsing the surface with water.

Detailed Description of the Invention

25 **[0018]** Any feature of one aspect of the present invention may be utilized in any other aspect of the invention. The word "comprising" is intended to mean "including" but not necessarily "consisting of" or "composed of." In other words, the listed steps or options need not be exhaustive. Except in the operating and comparative examples, or where otherwise explicitly indicated, all numbers in this description indicating amounts of material or conditions of reaction, physical properties of materials and/or use are to be understood as modified by the word "about". Numerical ranges expressed in the format "from x to y" are understood to include x and y. When for a specific feature multiple preferred ranges are described in the format "x to y", it is understood that all ranges combining the different endpoints are also contemplated. Unless specified otherwise, amounts as used herein are expressed in percentage by weight based on total weight of the composition. The use of any and all examples or exemplary language e.g. "such as" provided herein is intended merely to better illuminate the invention and does not in any way limit the scope of the invention otherwise claimed. Room temperature is defined as a temperature of about 25 degrees Celsius.

30 **[0019]** The term 'foaming composition' as used herein, refers to a composition which is suitable for generating a foam using a foam dispenser or foam trigger or such other foam generators known in the art. Preferably foam generation as referred herein does not include user interventions, such as, shaking or agitating a liquid composition by hand or any implement.

40 **[0020]** According to the present invention there is provided a foaming hard-surface cleaning composition comprising:

- a) a surfactant selected from cationic surfactant, amphoteric surfactant, nonionic surfactant and combinations thereof;
 45 b) an alkoxyated polyol polyester comprising at least three alkoxyate chains and at least two C8 to C40 fatty acid esters; and
 c) an acid selected from hydrochloride acid, sulphamic acid, tartaric acid, citric acid, malic acid, malonic acid, glycolic acid, maleic, lactic acid or combinations thereof, wherein the composition is free of anionic surfactant and free of C1 to C4 alcohol.

50 **Surfactant**

[0021] The composition comprises a surfactant, wherein the surfactant is selected from cationic surfactant, non-ionic surfactant, and combinations thereof. Preferably the amount of the surfactant is in the range from 0.1 to 50 % by weight of the composition. More preferably the amount of the surfactant is in the range from 0.2 to 45 % by weight, even more preferably 0.5 to 40 % by weight and most preferably 1 to 35% by weight of the composition.

Cationic Surfactant

[0022] Preferably the composition comprises cationic surfactant. Preferably the cationic surfactant is a quaternary ammonium compound.

5 **[0023]** Examples of suitable quaternary ammonium compounds include alkyl ammonium halides such as cetyl trimethyl ammonium bromide, alkyl aryl ammonium halides such as octadecyl dimethyl ammonium bromide, N-alkyl pyridinium halides such as N-cetyl pyridinium bromide, and the like. One suitable type of quaternary ammonium compound includes those in which the molecules contain amine, ether or ester linkages such as octyl phenoxy ethoxy ethyl dimethyl benzyl ammonium chloride, N-(laurylcocoaminofmethyl)-pyridinium chloride, and the like. Another effective type of quaternary ammonium compound includes those in which the hydrophobic radical is characterized by a substituted aromatic nucleus as the case of lauryloxyphenyltrimethyl ammonium chloride, cetylaminophenyltrimethyl ammonium methosulfate, dodecylphenyltrimethyl ammonium methosulfate, dodecylbenzyltrimethylammonium chloride, chlorinated dodecylbenzyltrimethyl ammonium chloride, and the like. Preferably, the quaternary ammonium compound used in the present invention also provides antimicrobial efficacy or in other word, are biocidal in nature.

10 **[0024]** Particularly quaternary ammonium compounds include a single quaternary compound, as well as mixtures of two or more different quaternary compounds. Such quaternary compounds are available under the EMPIGEN, BARDAC, BARQUAT, HYAMINE, LONZABAC, and ONYXIDE trademarks, which are described in detail in textbooks, such, McCutcheon's Functional Materials (Vol. 2), North American Edition, 1998, and also in the respective product literature from the suppliers identified below.

20 **[0025]** For example, BARDAC 205M is described to be a liquid containing alkyl dimethyl benzyl ammonium chloride (Benzalkonium chloride, BKC), octyl decyl dimethyl ammonium chloride; didecyl dimethyl ammonium chloride (DDAC), and dioctyl dimethyl ammonium chloride (50% active) (also available as 80% active (BARDAC 208M)); described generally in McCutcheon's as a combination of alkyl dimethyl benzyl ammonium chloride and dialkyl dimethyl ammonium chloride); BARDAC 2050 is described to be a combination of octyl decyl dimethyl ammonium chloridedidecyl dimethyl ammonium chloride, and dioctyl dimethyl ammonium chloride (50% active) (also available as 80% active (BARDAC 2080)); BARDAC 2250 is described to be didecyl dimethyl ammonium chloride (50% active); BARDAC LF (or BARDAC LF-80), described as being based on dioctyl dimethyl ammonium chloride (BARQUAT MB-50, MX-50, OJ-50 (each 50% liquid) and MB-80 or MX-80 (each 80% liquid) are each described as an alkyl dimethyl benzyl ammonium chloride; BARDAC 4250 and BARQUAT 4250 Z (each 50% active) or BARQUAT 4280 and BARQUAT 4280Z (each 80% active) are each described as alkyl dimethyl benzyl ammonium chloride/alkyl dimethyl ethyl benzyl ammonium chloride. Also, HYAMINE 1622, described as diisobutyl phenoxy ethoxy ethyl dimethyl benzyl ammonium chloride (50% solution); HYAMINE 3500 (50% actives), described as alkyl dimethyl benzyl ammonium chloride (also available as 80% active (HYAMINE 3500-80)); and HYMAINE 2389 described as being based on methyl dodecyl benzyl ammonium chloride and/or methyl dodecyl xylene-bis-trimethyl ammonium chloride.

30 **[0026]** (BARDAC, BARQUAT and HYAMINE are presently commercially available from Lonza, Inc., Fairlawn, N. J.). BTC 50 NF (or BTC 65 NF) is described to be alkyl dimethyl benzyl ammonium chloride (50% active); BTC 99 is described as didecyl dimethyl ammonium chloride (50% active); BTC 776 is described to be myrisalkonium chloride (50% active); BTC 818 is described as being octyl decyl dimethyl ammonium chloride, didecyl dimethyl ammonium chloride, and dioctyl dimethyl ammonium chloride (50% active) (available also as 80% active (BTC 818-80%)); BTC 824 and BTC 835 are each described as being of alkyl dimethyl benzyl ammonium chloride (each 50% active); BTC 885 is described as a combination of BTC 835 and BTC 818 (50% active) (available also as 80% active (BTC 888)); BTC 1010 is described as didecyl dimethyl ammonium chloride (50% active) (also available as 80% active (BTC 1010-80)); BTC 2125 (or BTC 2125 M) is described as alkyl dimethyl benzyl ammonium chloride and alkyl dimethyl ethyl benzyl ammonium chloride (each 50% active) (also available as 80% active (BTC 2125 80 or BTC 2125 M)); BTC 2565 is described as alkyl dimethyl benzyl ammonium chlorides (50% active) (also available as 80% active (BTC 2568)); BTC 8248 (or BTC 8358) is described as alkyl dimethyl benzyl ammonium chloride (80% active) (also available as 90% active (BTC 8249)); ONYXIDE 3300 is described as n-alkyl dimethyl benzyl ammonium saccharinate (95% active). (BTC and ONYXIDE are presently commercially available from Stepan Company, Northfield, III). Benzyl-C12-14-alkyldimethylammonium chlorides benzyl C12-C16- alkyl dimethyl chlorides also available as EMPIGEN BAC 50 and EMPIGEN BAC 80. It is an aqueous solution of benzalkonium chloride at ca. 50% or 80% in water respectively. EMPIGEN BAC 50 and EMPIGEN 80 are readily biodegradable, EMPIGEN is commercially available from Innospec Performance Chemicals.

40 **[0027]** Polymeric quaternary ammonium salts of these monomeric structures may also be considered for the present invention. One example is POLYQUAT, described as being a 2-butenyldimethyl ammonium chloride polymer.

45 **[0028]** Preferably the quaternary ammonium compound is selected from didecyl dimethyl ammonium chloride, dioctyl dimethyl ammonium chloride, alkyl dimethyl benzyl ammonium chloride, diisobutyl phenoxy ethoxy ethyl dimethyl benzyl ammonium chloride, alkyl dimethyl benzyl ammonium saccharinate, octyl decyl dimethyl ammonium chloride, alkyl dimethyl ethyl benzyl ammonium chloride, methyl dodecyl benzyl ammonium chloride, methyl dodecyl xylene-bis-trimethyl ammonium chloride, methyl benzethonium chloride, trimethyl stearyl ammonium Chloride, cetylpyridinium

chloride, cetrimonium bromide and combinations thereof.

[0029] Preferably the amount of cationic surfactant, when present, is in the range from 0.1 to 20 % by weight, more preferably from 0.1 to 18 % by weight, even more preferably from 0.1 to 16 % by weight, yet more preferably 0.1 to 14 % by weight and most preferably from 0.1 to 12 % by weight of the composition.

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Amphoteric surfactant

[0030] The composition may comprise amphoteric surfactant. Preferably the amphoteric surfactant is selected from amine oxide, alkyl betaine, alkyl amido propyl betaine, alkyl sulpho-betaine, and combinations thereof.

10 **[0031]** Preferably amine oxide is selected from alkyl dimethyl amine oxide, alkyl amido propyl dimethyl amine oxide and combinations thereof. Examples of suitable amine oxide includes lauryl dimethylamine oxide, coco dimethyl amine oxide and coco amido propyl dimethyl amine oxide.

[0032] Preferably betaine is selected from alkyl betaine, alkyl amido betaine, alkyl amidopropyl betaine, alkyl sulpho-betaine and alkyl phosphobetaine, wherein the alkyl group has from 8 to 19 carbon atoms.

15 **[0033]** Examples of suitable betaine includes cocodimethyl sulphopropyl betaine, cetyl betaine, laurylamidopropyl betaine, caprylate/caprato betaine, capryl/capramidopropyl betaine, cocamidopropyl hydroxysultaine, cocobutyramido hydroxysultaine, and preferably lauryl betaine, cocamidopropyl betaine and sodium cocamphopropionate. Most preferred betaine is cocamidopropyl betaine (CAPB).

20 **[0034]** Preferably the amount of amphoteric surfactant, when present, is in the range from 0.1 to 50 % by weight, more preferably from 0.1 to 45 % by weight, even more preferably 0.2 to 40% by weight, yet more preferably 0.5 to 35 % by weight and most preferably 1 to 30 % by weight of the composition.

25 **[0035]** Preferably the composition comprises a combination of cationic surfactant and amphoteric surfactant. Preferably the composition comprises a quaternary ammonium compound as cationic surfactant along with an amphoteric surfactant. It is observed that the quaternary ammonium compound also provides antimicrobial efficacy. Most preferred quaternary ammonium compound is benzalkonium chloride.

[0036] The composition may also comprise amine oxide or a betaine in addition to the cationic surfactant. It is observed that the combination of the surfactants further improves foam stability. Preferably the ratio of the cationic surfactant to the amphoteric surfactant is in the range from 1:1 to 1:10, more preferably 1:2 to 1:8, even more preferably 1:3 to 1:7 and most preferably 1:4 to 1:6 by weight.

30

Non-ionic surfactant

[0037] The composition may comprise a non-ionic surfactant. Preferably the non-ionic surfactant selected from alkyl polyglycoside, ethoxylated alcohol comprising at least 10 ethoxylated (EO) group and combinations thereof.

35 **[0038]** Preferably the non-ionic surfactant is alkyl polyglycosides (APG). Alkyl polyglycosides are compounds having the formula(I): $R_1O(R_2O)_b(Z)_a$, wherein R_1 is a alkyl radical, having from about 8 to about 10 carbon atoms; R_2 is an alkylene radical having from 2 to 4 carbon atoms; Z is a saccharide residue having 5 or 6 carbon atoms; b is a number having a value from 0 to about 12; and a is a number having a value from 1 to about 6 (the degree of polymerization). Due to the method by which they are synthesized, alkyl polyglycosides are generally present as mixtures of alkyl polyglycosides having varying amounts of carbon atoms in the alkyl radical and varying degrees of polymerization. Thus, when referring to alkyl polyglycosides, the alkyl radical is generally referred to as having a range of carbon atoms, for example, C8/10 referring to a range of alkyl radicals having from 8-10 carbon atoms and the degree of polymerization is generally referred to as the average degree of polymerization of the mixture.

45 **[0039]** Preferably alkyl polyglycosides suitable for use in the present invention include those having the formula I wherein Z is a glucose residue, b is zero, R_1 is an alkyl group that contains 8 to 10 carbon atoms, and the average value of a is about 1-2. Such alkyl polyglucosides are commercially available, for example, as Glucocon® from BASF (formerly Cognis Corporation), including Glucocon® 215CS UP and 225 DK.

[0040] Preferably the alkyl polyglycoside is an alkyl polyglucoside surfactant.

50 **[0041]** Examples of other alkyl polyglucoside surfactants which may also be considered are decyl glucoside, lauryl glucoside, myristyl glucoside.

[0042] Alcohol ethoxylate surfactants suitable for the present invention are the condensation products of an alkanol containing about 8 to 18 carbon atoms in a straight or branched chain condensed with at least 10 moles of ethylene oxide.

55 **[0043]** Examples of non-ionic surfactant which may also be considered in the present invention include condensates of 2 to 30 moles of ethylene oxide with sorbitan mono- and tri-C10-C20 alkanolic acid esters having a HLB of 10 to 15. These surfactants are well known and are available from Imperial Chemical Industries under the Tween trade name. Suitable surfactants include polyoxyethylene (4) sorbitan monolaurate, polyoxyethylene (4) sorbitan monostearate, polyoxyethylene (20) sorbitan trioleate and polyoxyethylene (20) sorbitan tristearate.

[0044] Preferably the amount of non-ionic surfactant, when present, is in the range from 0.1 to 50 % by weight, more

preferably from 0.2 to 45% by weight, even more preferably from 0.5 to 40 % by weight and most preferably 1 to 35 % by weight of the composition.

[0045] Preferably the composition comprises nonionic surfactant along with a cationic surfactant or an amphoteric surfactant. It may also be possible that the composition comprises all three types, namely, nonionic, cationic, and amphoteric surfactant.

Anionic surfactants

[0046] The cleaning composition is free from anionic surfactant. The term 'free of anionic surfactant' herein refers to the composition comprising less than 1 % by weight, preferably less than 0.5 % by weight, more preferably less than 0.2 % by weight and most preferably less than 0.1 % by weight of anionic surfactant.

[0047] Most preferably the composition does not contain anionic surfactant.

[0048] Preferably, there is no anionic surfactant added in the composition as an active detergent ingredient. However, it may be possible to have traces of anionic surfactant in one or more raw materials as stabilizer or emulsifier.

Alkoxyated polyol polyester

[0049] The composition comprises an alkoxyated polyol polyester. The alkoxyated polyol polyester comprises at least three alkoxyate chains and at least two C8 to C40 fatty acid esters.

[0050] It is observed that alkoxyated polyol polyester in combination with the select surfactants provides a stable foam. The term 'stable' herein refers to the foam having significantly higher retention time, i.e., time it takes to collapse after dispensing on a surface. Increase retention time provide longer contact time with substrate, thus helps in cleaning.

[0051] The alkoxyated polyol polyester comprises at least 3 alkoxyate chains attached to the polyol. Preferably it comprises 3 to 25, more preferably 4 to 20 and most preferably 5 to 15 alkoxyate chains. Preferably the alkoxyated polyol polyester comprises 50 to 1000, more preferably 100 to 800 and even more preferably 150 to 600 and most preferably 200 to 500 alkoxyate units.

[0052] Preferably each alkoxyate chain comprises 30 to 150, more preferably 30 to 120 and most preferably 30 to 80 alkoxyate units. Preferably the alkoxyate unit is ethoxyate or propoxyate. Preferably the alkoxyated polyol polyester is ethoxyated polyol polyester.

[0053] Preferably the alkoxyated polyol polyester comprises a polyol having 3 to 25 carbon atoms, more preferably 4 to 20 even more preferably 5 to 15 and most preferably 5 to 10 carbon atoms.

[0054] The polyol in the present invention can be natural polyols or synthetic polyols of having at least three hydroxyl groups, and their examples are shown (but not limited to) from the following classes of compounds:

Sugar alcohols, also called polyhydric alcohol or polyalcohol with at least three hydroxyl groups, having the general formula of HOCH₂(CHOH)_xCH₂OH. Examples include, but not limited to, mannitol, sorbitol, galactitol, fucitol, iditol, inositol, volemitol, isomalt, maltitol, lactitol, maltotritol, maltotetraol, and polyglycitol; Disaccharide, which is formed from two monosaccharide by dehydration via glycosidic linkage, examples include but not limited to, trehalose, sucrose, lactose, and maltose; Dextrin with a chemical structure of (C₆H₁₀O₅)_n, where n is from 2 to 20; Pentaerythritol and di-pentaerythritol; Dendrimer polyols, for examples, Bolton(R)H2004, H2003, and H20 have 6, 12, and 16 terminal hydroxyls, respectively; Polyglyceryls with 3 to 10 glycerin units, with six or more hydroxyl groups, and glycerol.

[0055] Preferably, the polyol is selected from polyols having 3 to 6 hydroxyl groups, more preferably selected from sorbitol, pentaerythritol and glycerol.

[0056] At least 2 of the alkoxyated arms of the alkoxyated polyol polyester are capped with a fatty acid ester having 8 to 40 carbon atoms. Preferably the fatty acid ester has 10 to 30, more preferably 12 to 24 and most preferably 14 to 20 carbon atoms. The fatty acid ester may be straight chain or branched, saturated or unsaturated. Preferably the fatty acid ester group independently selected from lauric, stearic, iso-stearic, guerbet moieties and combinations thereof.

[0057] Preferably the alkoxyated polyol polyester has HLB (hydrophilic-lipophilic balance) values more than 10. Preferably the alkoxyated polyol polyester is ethoxyated sorbitan di or tri ester.

[0058] Preferably the alkoxyated polyol polyester is available with an organic carrier selected from of mono or polyhydric alcohols and ether, ester or amide derivatives and hydrophobic thickeners containing non-ionic alkanolamines, ethoxyated C10 to C14 alcohols, liquid alkanolamines and combinations thereof.

[0059] Preferred alkoxyated polyol polyesters include 40-50% PEG/PPG-120/10 trimethylolpropane trioleate; lauryl polyoxyl-6 glycerides / hydrogenated palm/palm kernel oil PEG-6 esters; PEG-150 pentaerythrityl tetra-stearate, PEG-150 pentaerythrityl tetra-stearate; PEG-20 glyceryl tri-stearate, PEG-20 glyceryl tri-isostearate, PEG-10 glyceryl trioleate, PEG-40 glyceryl trioleate, PEG-60 glyceryl trioleate; sorbeth-230 tetraoleate; and PEG-120 methyl glucose trioleate, PEG-120 methyl glucose trioleate.

[0060] Commercially available alkoxyated polyol polyesters include Sorbithix L-100 (Applechem LLC.), Versathix MBAL-LQ (Croda), Labrafil M2130 CS (Gattefosse), Sorbax PTO-20 (PCC), Atlas G1096 (Croda), Arylpon TT (BASF), SP

Crothix MBAL LQ (Croda), Examlex GWS 320, GWIS 320, GWO 320, GWO 340, GWO 360 (Nihon Emulsions), and Novethix HC220 (Lubrizol) Oxiflow® F1700 (Oxiten S.A).

[0061] One of the preferred alkoxyated polyol polyester is Sorbeth 450 tri-stearate with PEG-9 Cocoate (and) PEG-32 Distearate (and) PEG-175 Distearate commercially available from Oxiten S.A.

[0062] Preferably the amount of the alkoxyated polyol polyester is in the range from 0.1 to 40 % by weight, more preferably 0.2 to 35% by weight, even more preferably 0.5 to 30 % by weight and most preferably 1 to 25 % by weight of the composition.

Water

[0063] The composition may comprise water. Preferably water works as carrier or balancing ingredients. Preferably the composition comprises up to 98 % by weight water. More preferably the composition up to 95 % by weight, even more preferably up to 90 % by weight, yet more preferably up to 85 % by weight and most preferably up to 80 % by weight of water.

[0064] The composition may also be provided in concentrated format. In such cases, the composition may contain significantly reduced amount of water. Preferably in concentrated format the composition comprises less than 20 % by weight, more preferably less than 15 % by weight, and even more preferably less than 10 % by weight water. Most preferably there is no water added to the composition in concentrated format, however it may contain certain amount of water, which is sourced along with raw materials available as dispersion or solution.

Acid

[0065] The composition comprises an acid. Preferably the composition have a pH less than 7, more preferably less than 6, even more preferably less than 5 and yet more preferably less than 4 and most preferably less than 3. It is suitable for removing scaling from hard surfaces, such as bathroom tiles and toilet bowls. The acid is selected from inorganic acid, for examples, hydrochloride acid, sulphuric acid, sulphamic acid, or organic acid for examples tartaric acid, citric acid, malic acid, malonic acid, glycolic acid, maleic, citric, lactic acid or combinations thereof.

[0066] Preferably the amount of the acid is in the range from 0.1 to 30 % by weight, more preferably 0.2 to 25 % by weight, even more preferably 0.3 to 20 % by weight, yet more preferably 0.4 to 15% by weight and most preferably 0.5 to 12% by weight of the composition.

Non-aqueous solvent

[0067] The composition may further comprise a solvent as carrier or balancing ingredient, particularly in concentrated format and in lieu of water. Preferably the solvent is miscible or soluble in water. Preferably the solvent comprises a hydrotrope, which also work as non-aqueous carrier. Hydrotrope are typically low molecular weight, water-soluble or water-miscible organic liquids such as polyethylene glycols having a weight average molecular weight (Mw) ranging from about 200 to 600, and alkyl aryl sulfonates having up to 3 carbon atoms in the lower alkyl group, e.g., sodium and potassium salt of xylene, toluene, ethylbenzene and isopropyl benzene (cumene) sulfonates. Mixtures of any of said materials may also be used.

[0068] Examples of other non-aqueous solvent suitable for the invention include glycol ethers such as diethylene glycol alkyl ether, dipropylene glycol alkyl ether, dipropylene dimethyl ether; alkyl esters such as, alkyl levulinate, alkyl octanoate, methyl and alkyl soyate; C1 to C4 alkyl amide such as N, N-dimethyl alkenamide, more preferably N, N-dimethyl decenamide; alkyl alkoxyate such as benzyl alkoxyate.

[0069] Preferably the amount of the solvent is in the range from 1 to 20 % by weight, more preferably 2 to 15 % by weight, even more preferably 3 to 10 % by weight of the composition.

[0070] According to the invention the composition is free of C1 to C4 alcohol. The term 'free of C1 to C4 alcohol' herein refers to the composition comprising less than 1 % by weight, preferably less than 0.5 % by weight, more preferably less than 0.2 % by weight and most preferably less than 0.1 % by weight of C1 to C4 alcohol. Examples of such alcohols are methanol, ethanol etc. Preferably, there is no C2 to C4 alcohol added to the composition as an active ingredient. However, it may be possible to have traces of it in one or more raw materials. Often such alcohols evaporate quickly on application. This may lead to deposition of insoluble on a surface, which is not preferable.

Further ingredients

[0071] The composition may further comprise various ingredients such as, antifoaming agent, builder, anti-greasing agent, antimicrobial agents, preservatives, polymers, fragrance, colourant, pH adjuster for providing respective functional benefits.

Sequestrant

[0072] The composition preferably comprises a sequestrant. Builders or sequesters help in removing or sequestering calcium and/or magnesium ions in the water. Preferably the sequestrant is selected from organic detergent builders or sequestrant materials. Examples include the alkali metal, citrates, succinates, malonates, carboxymethyl succinates, carboxylates, polycarboxylates and polyacetyl carboxylates. Specific examples include sodium, potassium and lithium salts of oxydisuccinic acid, mellitic acid, benzene polycarboxylic acids, and citric acid. Other examples are DEQUEST™, organic phosphonate type sequestering agents sold by Monsanto and alkanehydroxy phosphonates.

[0073] A preferred sequestrant is Dequest® 2066 (Diethylenetriamine penta(methylene phosphonic acid) or Hepta-sodium DTPMP). Other suitable sequestrant is HEDP (1-Hydroxyethylidene -1,1-diphosphonic acid), for example sold as Dequest 2010.

[0074] The composition may comprise 0.1 to 10% wt. more preferably 0.1 to 5% wt. of sequestrant. Preferably composition is free of a non-phosphate-based builder, which includes containing less than 1 wt.% of phosphate

Product format

[0075] Based on application, the composition may be formulated as neat or concentrated format. The term 'neat' herein refers to the composition is used as is without further dilution. Whereas in 'concentrated' format, preferably the composition is diluted in water to form a working solution and use it. Particular advantage of the concentrated format is that the composition in such form may be packed in significantly small pack and consumes much less packaging material.

Neat format

[0076] The composition may be provided in neat format wherein it comprises 0.1 to 20 % by weight the surfactant. More preferably the composition comprises 0.2 to 15 % by weight, even more preferably 0.5 to 10 % by weight and most preferably 1 to 7 % by weight of the surfactant.

[0077] Preferably the amount of cationic surfactant when present is in the range from 0.1 to 8 % by weight, more preferably 0.1 to 6 % by weight, even more preferably 0.1 to 4 % by weight and most preferably 0.1 to 2 % by weight of the composition.

[0078] Preferably the amount of amphoteric surfactant when present is in the range from 0.1 to 20 % by weight, more preferably 0.2 to 15% by weight, even more preferably 0.5 to 10 % by weight and most preferably 1 to 8 % by weight of the composition.

[0079] Preferably the amount of non-ionic surfactant when present is in the range from 0.1 to 20 % by weight, more preferably 0.2 to 15% by weight, even more preferably 0.5 to 10 % by weight and most preferably 1 to 8 % by weight of the composition.

[0080] Preferably the amount of the alkoxyated polyol polyester is in the range from 0.1 to 20 % by weight, more preferably 0.2 to 15% by weight, even more preferably 0.5 to 10 % by weight and most preferably 1 to 8 % by weight of the composition.

[0081] Preferably the amount of the acid is in the range from 0.1 to 15 % by weight, more preferably 0.2 to 12 % by weight and most preferably 0.5 to 10 % by weight the composition.

[0082] Preferably the composition in neat format is an aqueous composition, i.e., water is the balance in the composition. Preferably the composition comprises 1 to 98 % by weight, more preferably 5 to 95 % by weight, even more preferably 10 to 90 % by weight and most preferably 15 to 85 % by weight of water.

[0083] The composition in neat format may be provided in a container, which is equipped with a foam trigger, and the composition is dispensed as foam on the desired surface. It may also be possible to pack such composition in a refill pouch or pack, which may be used to fill the container once it is empty.

Concentrated format

[0084] The composition may also be provided in concentrated format. Consumer dilutes the concentrated composition by adding sufficient water, thereby forms a working solution and use it.

[0085] Preferably the composition in concentrated format comprises 5 to 50 % by weight of the surfactant. More preferably the composition comprises 7 to 45 % by weight, even more preferably 10 to 40% by weight and most preferably 12 to 35 % by weight of the surfactant.

[0086] Preferably the amount of cationic surfactant when present is in the range from 1 to 20 % by weight, more preferably 2 to 16 % by weight, even more preferably 3 to 14 % by weight and most preferably 4 to 12 % by weight of the composition

[0087] Preferably the amount of amphoteric surfactant when present is in the range from 5 to 50 % by weight, more

preferably 7 to 45% by weight, even more preferably 10 to 40 % by weight and most preferably 12 to 35 % by weight of the composition.

[0088] Preferably the amount of non-ionic surfactant when present is in the range from 5 to 50 % by weight, more preferably 7 to 45% by weight, even more preferably 10 to 40 % by weight and most preferably 12 to 35 % by weight of the composition.

[0089] Preferably the amount of the alkoxyated polyol polyester is in the range from 5 to 40 % by weight, more preferably 7 to 35% by weight, even more preferably 10 to 30 % by weight and most preferably 12 to 25 % by weight of the composition.

[0090] Preferably the amount of the acid is in the range from 1 to 30 % by weight, more preferably 2 to 25 % by weight and most preferably 3 to 20 % by weight the composition.

[0091] Preferably the composition in concentrated comprises a solvent as balance. Preferably the amount of the solvent is in the range from 1 to 20 % by weight, more preferably 2 to 15 % by weight, even more preferably 3 to 10 % by weight of the composition.

[0092] Preferably there is no water added to the composition in concentrated format, however it may contain certain amount of water sourced along with raw materials available as dispersion or solution.

[0093] The composition in concentrated format may be provided in a container with sufficient empty space and the container is equipped with a foam trigger. In use consumer add water in the container to a pre-set label making a working solution. Alternatively, the composition may also be available in a smaller refill pouch and consumer prepare the working solution by adding water separately and subsequently fill a container equipped with a foam trigger. The composition is dispensed as foam on the desired surface. Preferably the composition when diluted in water, the ratio of the composition to water is in the range 1:1 to 1: 20 by weight, more preferably 1:2 to 1:18, even more preferably 1:4 to 1:16 and most preferably 1: 6 to 1:15 by weight.

[0094] The present invention provides a concentrated cleaning product for providing a foaming composition on dilution in water comprising a composition according to the present invention and less than 20 % by weight water. Preferably the product comprises less than 15 % by weight and more preferably less than 10% by weight water. Consumers are supposed to dilute the product in water to form a working solution and use it. The product may be diluted in water to in a ratio from 1:10 to 1:20, more preferably 1:12 to 1:18 and most preferably 1:14 to 1:16 by weight. Preferably the product is provided in a container with sufficient empty space and a foam trigger. Consumers fill the container up to pre-set marking forming the foaming composition, subsequently attach the foam trigger and use it. Preferably the concentrated cleaning product comprise 5 to 50 % by weight, more preferably 10 to 50 % by weight and most preferably 20 to 50 % by weight surfactant and 5 to 40 % by weight, more preferably 10 to 40 % by weight and most preferably 15 to 40 % by weight alkoxyated polyol polyester.

[0095] There is provided a cleaning product comprising a foam dispenser and a cleaning composition according to the present invention, wherein the composition is housed in the dispenser. The foam dispenser herein may be a pressurised gas-based or foam trigger-based dispenser.

[0096] Preferably the foam dispenser comprises a container to hold the composition and a foam trigger, which includes a trigger lever, a pump, a mixing chamber and a nozzle. The pump comprises a piston moving in a cavity against a spring. The cavity is in fluid communication with the container and the mixing chamber, wherein it has one-way valves which allow the composition to flow from the container to the mixing chamber. Typically, the foam trigger is actuated by pressing the trigger lever, which in turn pressed the piston against the spring thereby pushing the composition stored in the cavity to the mixing chamber. In the mixing chamber the composition mixed with air and pass through a mesh before dispensing out of the nozzle as foam. On subsequent release of the trigger lever, the spring push back the piston, thereby the empty cavity fills with the composition flowing from the container. Foam dispensers equipped with foam trigger rely on the pump action, hence do not require a pressurised gas.

[0097] It may also possible that the foam dispenser comprises a pressurised gas, stored along with the composition in the container. Such dispenser is activated by opening a one-way valve, thereby releases the gas along with composition through a nozzle and dispenses a foam.

Process

[0098] The invention provides a process for cleaning a hard surface comprising steps of:

- a) providing a composition according to the present invention in a container equipped with a foam trigger;
- b) dispensing the composition as foam; and
- c) optionally rinsing with water.

[0099] The composition is dispensed as foam directly on the surface without a user intervention, such as, pouring on a wipe or cloth or brush and apply with such implements to the surface. The surface may be pre-wetted with water. The composition in foam format clings to the surface providing longer contact time, thus provides enhanced cleaning. Further it

may be possible to directly apply the foam on nook and corners or the surface, such as toilet rims. Preferably the surface is rinsed with water after an interval.

[0100] It may also possible that a consumer further uses an implement such as, wipe or sponge to apply the foam on the surface.

5 **[0101]** The invention will now be illustrated by means of the following non-limiting examples.

Examples

10 **[0102]** Formulations were prepared following the recipes provided in table 1. Subsequently, foam retention time was evaluated for each formulation. Each formulation was filled in a 100 ml container equipped with a foam trigger. A ceramic tile having dimension 18 x 18 cm, was placed inclined at 30° angle. Each formulation was dispensed as foam on the tile. Foam retention time, i.e., the time taken to collapse the foam was measured with a stopwatch

Table 1:

Materials (%w/w)	Ex-A	Ex-1	Ex-2	Ex-3	Ex-4	Ex-B	Ex-C
Oxiflow® F1700*	-	2	2	2	2	2	2
Benzalkonium chloride	-	-	-	2	-	-	-
20 Coco amido propyl betaine (CAPB)	2	2	-	-	-	-	-
N-N Dimethyl dodecyl amine N-Oxide	-	-	2	-	-	-	-
25 C8-C16 APG (Glucopon 420 U)	-	-	-	-	2	-	-
Primary alkyl sulphate	-	-	-	-	-	2	-
30 Linear alkyl benzene sulphonate	-	-	-	-	-	-	2
Hydrochloric acid (HCl)	1	1	1	1	1	1	1
Water	Up to 100						
35 Foam retention time (sec)	12	150	280	285	130	21	22
*Sorbeth-450 Tristearate, PEG-9 Cocoate, PEG-32 di-stearate and PEG-175 di-stearate							

40 **[0103]** Ex-A is control example, does not contain Oxiflow® F1700, whereas Ex- B and C are comparative containing anionic surfactant along with Oxiflow® F1700. Ex-1 to 4 are according to the invention. Ex-1 to 4 show significantly higher foam retention time compared to A to C.

Examples for neat and concentrated format:

45 **[0104]** Ex-5 and 6 were prepared following the below recipe:

Table 5:

Materials (%w/w)	Ex-5	Ex-6
50 BKC (50% active) +	1.2	18.0
Oxiflow F1700	2.00	30.00
Amine Oxide	2.00	30.00
HCl	0.75	11.25
55 Sequestrant	0.25	3.75
MPG	--	Up to 100
Water	Up to 100	-

(continued)

Materials (%w/w)	Ex-5	Ex-6
Perfume	0.10	1.50
Dye	0.01	0.15
*rest is water		

[0105] Ex-5 is a formulation according to the invention in neat format, i.e., can be used as is. On the other hand, Ex-6 is a formulation within the scope of the invention in concentrated format. Ex-8 may be diluted 10 to 15 times in water to make a working formulation and use it.

Claims

1. A foaming acidic hard-surface cleaning composition comprising:

- a) a surfactant selected from cationic surfactant, amphoteric surfactant, nonionic surfactant, and combinations thereof;
 - b) an alkoxyated polyol polyester comprising at least three alkoxyate chains and at least two C8 to C40 fatty acid esters; and
 - c) an acid selected from hydrochloride acid, sulphamic acid, tartaric acid, citric acid, malic acid, malonic acid, glycolic acid, maleic, lactic acid and combinations thereof,
- wherein the composition is free of anionic surfactant,
wherein the composition is free of C1 to C4 alcohol.

2. A composition as claimed in claim 1 wherein the cationic surfactant selected from didecyl dimethyl ammonium chloride, dioctyl dimethyl ammonium chloride, alkyl dimethyl benzyl ammonium chloride, diisobutyl phenoxy ethoxy ethyl dimethyl benzyl ammonium chloride, alkyl dimethyl benzyl ammonium saccharinate, octyl decyl dimethyl ammonium chloride, alkyl dimethyl ethyl benzyl ammonium chloride, methyl dodecyl benzyl ammonium chloride, methyl dodecyl xylene-bis-trimethyl ammonium chloride, methyl benzethonium chloride, trimethyl stearyl ammonium chloride, cetylpyridinium chloride, cetrimonium bromide and combinations thereof.

3. A composition as claimed in claim 1 wherein the nonionic surfactant selected from alkyl polyglycoside, ethoxylated alcohol comprising at least 10 ethoxylated (EO) group, and combinations thereof.

4. A composition as claimed in claim 1 wherein the amphoteric surfactant is selected from amine oxides, alkyl betaines, alkyl amido propyl betaines, alkyl sulfo-betaines, and combinations thereof.

5. A composition as claimed in any one of claims 1 to 4 wherein the amount of the surfactant is in the range from 0.1 to 50 % by weight of the composition.

6. A composition as claimed in any one of claims 1 to 5 wherein the amount of the alkoxyated polyol polyester is in the range from 0.1 to 40 % by weight of the composition.

7. A composition as claimed in any one of claims 1 to 6 wherein the alkoxyated polyol polyester comprises 50 to 1000 alkoxyate units.

8. A composition as claimed in claim 7 wherein the alkoxyate unit is ethoxylate or propoxylate.

9. A composition as claimed in any one of claims 1 to 8 wherein the polyol in the alkoxyated polyol polyester is selected from sorbitol, pentaerythritol and glycerol.

10. A composition as claimed in any one of claims 1 to 9 wherein the fatty acid ester is selected from laurate, stearate, iso-stearate, oleate, guerbet acid ester and combinations thereof.

11. A composition as claimed in any one of claims 1 to 10 wherein the alkoxyated polyol polyester is ethoxylated sorbitan

di or tri ester.

12. A concentrated cleaning product for providing a foaming composition on dilution in water comprising a composition as claimed in any one of claims 1 to 11 with less than 20 % by weight water.

13. A cleaning product comprising a foam dispenser and a cleaning composition as claimed in any one of claims 1 to 11, wherein the composition is housed in the dispenser.

14. A process for cleaning a hard surface comprising steps of

- a) providing a composition as claimed in any one of claims 1 to 11 in a container equipped with a foam trigger;
- b) dispensing the composition as foam; and
- c) optionally rinsing the surface with water.

Patentansprüche

1. Schäumende saure Reinigungszusammensetzung für harte Oberflächen, umfassend:

- a) ein Tensid, ausgewählt unter kationischem Tensid, amphoterem Tensid, nichtionischem Tensid und Kombinationen davon;
- b) einem alkoxylierten Polyolpolyester, der mindestens drei Alkoxyalketten und mindestens zwei C8- bis C40-Fettsäureester umfasst; und
- c) eine Säure, ausgewählt unter Salzsäure, Sulfaminsäure, Weinsäure, Zitronensäure, Äpfelsäure, Malonsäure, Glykolsäure, Maleinsäure, Milchsäure und Kombinationen davon, wobei die Zusammensetzung frei von anionischem Tensid ist, wobei die Zusammensetzung frei von C1- bis C4-Alkohol ist.

2. Zusammensetzung nach Anspruch 1, wobei das kationische Tensid ausgewählt ist unter Didecyldimethylammoniumchlorid, Dioctyldimethylammoniumchlorid, Alkyldimethylbenzylammoniumchlorid, Diisobutylphenoxyethoxyethyl dimethylbenzylammoniumchlorid, Alkyldimethylbenzylammoniumsaccharinat, Octyldodecyldimethylammoniumchlorid, Alkyldimethylethylbenzylammoniumchlorid, Methyl dodecylbenzylammoniumchlorid, Methyl dodecylxilen-bistrimethylammoniumchlorid, Methylbenzethoniumchlorid, Trimethylstearyl ammoniumchlorid, Cetylpyridiniumchlorid, Cetrimoniumbromid und Kombinationen davon.

3. Zusammensetzung nach Anspruch 1, wobei das nichtionische Tensid unter Alkylpolyglykosid, ethoxyliertem Alkohol, der mindestens 10 ethoxylierte (EO) Gruppen umfasst, und Kombinationen davon ausgewählt ist.

4. Zusammensetzung nach Anspruch 1, wobei das amphotere Tensid unter Aminoxiden, Alkylbetainen, Alkylamido-propylbetainen, Alkylsulfobetainen und Kombinationen davon ausgewählt ist.

5. Zusammensetzung nach irgendeinem der Ansprüche 1 bis 4, wobei die Menge des Tensids im Bereich von 0,1 bis 50 Gew.-% der Zusammensetzung liegt.

6. Zusammensetzung nach irgendeinem der Ansprüche 1 bis 5, wobei die Menge des alkoxylierten Polyolpolyesters im Bereich von 0,1 bis 40 Gew.-% der Zusammensetzung liegt.

7. Zusammensetzung nach irgendeinem der Ansprüche 1 bis 6, wobei der alkoxylierte Polyolpolyester 50 bis 1000 Alkoxyaleinheiten umfasst.

8. Zusammensetzung nach Anspruch 7, wobei die Alkoxyaleinheit Ethoxyale oder Propoxyale ist.

9. Zusammensetzung nach irgendeinem der Ansprüche 1 bis 8, wobei das Polyol in dem alkoxylierten Polyolpolyester unter Sorbit, Pentaerythrit und Glycerin ausgewählt ist.

10. Zusammensetzung nach irgendeinem der Ansprüche 1 bis 9, wobei der Fettsäureester unter Laurat, Stearat, Isostearat, Oleat, Guerbet-Säureester und Kombinationen davon ausgewählt ist.

11. Zusammensetzung nach irgendeinem der Ansprüche 1 bis 10, wobei der alkoxylierte Polyolpolyester ein ethoxylierter Sorbitan-di- oder -triester ist.
- 5 12. Konzentriertes Reinigungsmittel zur Bereitstellung einer schäumenden Zusammensetzung bei Verdünnung in Wasser, umfassend eine Zusammensetzung nach irgendeinem der Ansprüche 1 bis 11 mit weniger als 20 Gew.-% Wasser.
- 10 13. Reinigungsmittel, umfassend einen Schaumspender und eine Reinigungszusammensetzung nach irgendeinem der Ansprüche 1 bis 11, wobei die Zusammensetzung in dem Spender untergebracht ist.
14. Verfahren zur Reinigung einer harten Oberfläche, umfassend die Schritte
- 15 a) Bereitstellen einer Zusammensetzung nach irgendeinem der Ansprüche 1 bis 11 in einem mit einem Schaumauslöser ausgestatteten Behälter;
- b) Abgeben der Zusammensetzung als Schaum; und
- c) optionales Spülen der Oberfläche mit Wasser.

Revendications

- 20 1. Composition nettoyante acide moussante pour surfaces dures, comprenant :
- 25 a) un tensioactif choisi parmi un tensioactif cationique, un tensioactif amphotère, un tensioactif non-ionique et leurs combinaisons ;
- b) un polyester de polyol alcoxylé comprenant au moins trois chaînes alcoxylate et au moins deux esters d'acide gras en C₈ à C₄₀; et
- 30 c) un acide choisi parmi l'acide chlorhydrique, l'acide sulfamique, l'acide tartrique, l'acide citrique, l'acide malique, l'acide malonique, l'acide glycolique, l'acide maléique, l'acide lactique et leurs combinaisons, laquelle composition est exempte de tensioactif anionique, laquelle composition est exempte d'alcool en C₁ à C₄.
- 35 2. Composition selon la revendication 1, dans laquelle le tensioactif cationique est choisi parmi le chlorure de didécyldiméthylammonium, le chlorure de dioctyldiméthylammonium, un chlorure d'alkyldiméthylbenzylammonium, le chlorure de diisobutylphénoxyéthoxyéthylidiméthylbenzylammonium, un saccharinate d'alkyldiméthylbenzylammonium, le chlorure d'octyldécylidiméthylammonium, un chlorure d'alkyldiméthyléthylbenzylammonium, le chlorure de méthyldodécylbenzylammonium, le chlorure de méthyldodécylxylène-bis-triméthylammonium, le chlorure de méthylbenzéthonium, le chlorure de triméthylstéarylammonium, le chlorure de cétylpyridinium, le bromure de cétrimonium et leurs combinaisons.
- 40 3. Composition selon la revendication 1, dans laquelle le tensioactif non-ionique est choisi parmi un alkyldipolyglycoside, un alcool éthoxylé comprenant au moins 10 groupes d'éthoxylation (EO), et leurs combinaisons.
- 45 4. Composition selon la revendication 1, dans laquelle le tensioactif amphotère est choisi parmi les oxydes d'amine, les alkylbétaines, les alkylamidopropylbétaines, les alkylsulfobétaines, et leurs combinaisons.
- 50 5. Composition selon l'une quelconque des revendications 1 à 4, dans laquelle la quantité du tensioactif est située dans la plage allant de 0,1 à 50 % en poids de la composition.
6. Composition selon l'une quelconque des revendications 1 à 5, dans laquelle la quantité du polyester de polyol alcoxylé est située dans la plage allant de 0,1 à 40 % en poids de la composition.
7. Composition selon l'une quelconque des revendications 1 à 6, dans laquelle le polyester de polyol alcoxylé comprend de 50 à 1 000 motifs alcoxylate.
- 55 8. Composition selon la revendication 7, dans laquelle le motif alcoxylate est un motif éthoxylate ou propoxylate.
9. Composition selon l'une quelconque des revendications 1 à 8, dans laquelle le polyol dans le polyester de polyol alcoxylé est choisi parmi le sorbitol, le pentaérythritol et le glycérol.

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10. Composition selon l'une quelconque des revendications 1 à 9, dans laquelle l'ester d'acide gras est choisi parmi un laurate, un stéarate, un isostéarate, un oléate, un ester d'acide de Guerbet et leurs combinaisons.

5 11. Composition selon l'une quelconque des revendications 1 à 10, dans laquelle le polyester de polyol alcoxylé est un di- ou tri-ester de sorbitan éthoxylé.

12. Produit nettoyant concentré pour fournir une composition moussante lorsqu'il est dilué dans de l'eau, comprenant une composition selon l'une quelconque des revendications 1 à 11 avec moins de 20 % en poids d'eau.

10 13. Produit nettoyant comprenant un distributeur de mousse et une composition nettoyante selon l'une quelconque des revendications 1 à 11, dans lequel la composition est logée dans le distributeur.

14. Procédé pour nettoyer une surface dure, comprenant les étapes de

15 a) fourniture d'une composition selon l'une quelconque des revendications 1 à 11 dans un récipient équipé d'une gâchette à mousse ;
b) distribution de la composition sous la forme d'une mousse ; et
c) éventuellement rinçage à l'eau de la surface.

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REFERENCES CITED IN THE DESCRIPTION

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