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(54) **COMPOSITIONS SUITABLE FOR LAVATORY CLEANING COMPRISING NON-HYDRAULIC BINDERS**

(57) The present invention relates to a composition for lavatory cleaning comprising:

- at least one surfactant;
- at least one filler;
- at least one non-hydraulic binding agent;
- optionally at least one bittering agent;
- optionally at least one solvent;
- optionally at least one additive; and
- optionally fragrance components and/or a perfume.

The invention further relates to toilet rimblock and toilet cleaning system comprising said composition, the use of this composition as a toilet rimblock formulation for cageless release devices, the use of a non-hydraulic binding agent in sanitary cleaning compositions for stabilizing the shape of a toilet rimblock and the use of a non-hydraulic binding agent for increasing child-safety of a toilet rimblock or solid detergent.

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Description

[0001] The present invention relates to compositions suitable for lavatory cleaning, in particular useable as solid rimblocks, comprising at least one surfactant, at least one filler and at least one non-hydraulic binding agent. Furthermore, to a toilet cleaning system comprising the composition of the present invention and a release device. Moreover, to the use of a non-hydraulic binding agent in sanitary cleaning compositions, for stabilizing the shape of a toilet rimblock or for increasing child-safety of a toilet rimblock or solid detergent.

[0002] Solid lavatory cleaning compositions are known for a long time. There are two main categories of (in-bowl) lavatory cleaning composition namely self-adhesive "cageless" gels and solid rimblocks which require a hanger. The solid rimblock with hanger can be divided into two types namely compositions which are surrounded by the cage and "cageless" solid compositions which are applied via a hanger (stick) into the toilet bowl and stick to the hanger but are neither surrounded by the cage nor self-adhesive. Children can reach such "cageless" solid compositions under certain circumstances in the toilet bowl. When unattended, little children tend to test objects with their mouth. Therefore, there exists a need to improve sanitary cleaning compositions, in particular "cageless" solid compositions with regard to child safety. Thus, one object of the present invention is to provide a composition which has improved child safety when used as a "cageless" solid rimblock.

[0003] Moreover, such "cageless" solid compositions surround the hanger and thus "adhere" to it. When the composition is too soft, the water beam, while flushing, can crack the surface and the composition can fall off in bigger parts and is not homogeneously dissolved. Therefore, another object of the present invention is the provision of a composition which additionally does not crack and additionally provides evenly dissolution when used as a "cageless" solid rimblock.

[0004] The inventors of the present invention have surprisingly found that the addition of at least one non-hydraulic binding agent to a lavatory cleaning composition can solve the above described drawbacks of common solid "cageless" rimblocks.

[0005] In the present specification the terms "a" and "an" and "at least one" are the same as the term "one or more" and can be employed interchangeably.

[0006] In particular, the present invention relates to:

A composition for lavatory cleaning comprising:

- i) at least one surfactant;
- ii) at least one filler;
- iii) at least one non-hydraulic binding agent;
- iv) optionally at least one bittering agent;
- v) optionally at least one solvent;
- vi) optionally at least one additive; and
- vii) optionally fragrance components and/or a perfume.

[0007] In various embodiments, the composition described herein comprises at least one anionic surfactant, preferably at least one anionic surfactant and at least one non-ionic surfactant, more preferably at least one anionic surfactant selected from sulfonates, or sulfates or combinations thereof, even more preferred at least one anionic surfactant selected from sulfonates, or sulfates, and at least one non-ionic surfactant selected from alcohol alkoxylates, alkyl polyglycosides, fatty acid alkanolamides, alkylamine oxides, or alkylglucamides or combinations thereof.

[0008] In various embodiments, the composition described herein comprises as component ii) at least one filler selected from sulfate and carbonate fillers, preferably at least one filler selected from sodium sulfate, calcium sulfate, sodium carbonate, or calcium carbonate or combinations thereof, more preferably sodium sulfate.

[0009] In various embodiments, the composition described herein comprises as component iii) at least one non-hydraulic binding agent selected from clay; gypsum, like calcium sulfate dehydrate; non-hydraulic lime; amorphous calcium oxide; amorphous magnesium oxide; fireclay mortar; magnesium oxychloride cement; white lime; phosphate binder; soluble glass; or slaked lime or combinations thereof; preferably comprises at least one non-hydraulic binding agent selected from gypsum, like calcium sulfate dehydrate; non-hydraulic lime; amorphous calcium oxide; amorphous magnesium oxide; fireclay mortar; magnesium oxychloride cement; white lime; phosphate binder; soluble glass; or slaked lime or combinations thereof; more preferably comprises gypsum.

[0010] In various embodiments, component iv) has a bitterness value of from 1,000 to 200,000, preferably iv) comprises at least one bittering agent selected from glycosides, isoprenoids, alkaloids, or amino acids; more preferably iv) comprises flavonoids such as quercetin and naringin, iridoid glycosides such as aucubin, secoiridoid glycosides such as amarogentin, dihydrofoliamentin, gentiopicroside, gentiopicrin, swertiamarin, sweroside, gentioflavoside, centaurosides, metafolin, harpagoside, centapicine, saillcin, and conduranguin, sesquiterpene lactones such as absinthin, artabsin, cnicin, lactucin, lactucopicrin, and salonitenolid, monoterpene ketones (thujones) such as α -thujone and β -thujone, tetranortriterpenes

(limonoids) such as deoxylimonene, deoxylimononic acid, limonene, ichangin, isoobacunonic acid, obacunone, obacunonic acid, nomilin, and nomilinic acid, terpenes such as marrubin, premarrubin, carnosol, carnosolic acid, and quassin, alkaloids, like quinine hydrochloride, quinine hydrogen sulfate, quinine dihydrochloride, quinine sulfate, columbin, and caffeine, amino acids like threonine, methionine, phenylalanine, tryptophan, arginine, histidine, valine, aspartic acid, or denatonium; even more preferably iv) comprises denatonium.

[0011] In various embodiments, component v) comprises at least one solvent selected from water, alcohols, C5 to C20 alkanes, glycols like diethylene glycol and dipropylene glycol, and glycerol.

[0012] In various embodiments, component vi) comprises at least one additive selected from acids, bases, antimicrobial agents, thickening agents, corrosion inhibitors, flush regulators, enzymes, microorganisms, biofilm reducing agents, limescale reducing agents, pigments, colorants, or dyes or combinations thereof; preferably vi) comprises at least one additive selected from acids, antimicrobial agents, pigments, colorants, or dyes, more preferably vi) comprises at least one additive selected from acids, and colorants or combinations thereof.

[0013] In various embodiments,

the total amount of surfactants i) in the composition is 20 to 85 wt.-%, preferably 25 to 70 wt.-%, more preferably 30 to 65 wt.-%;

the total amount of fillers ii) is 10 to 70 wt.-%, preferably 25 to 65 wt.-%, more preferably 35 to 60 wt.-%, most preferably 20 to 30 wt.-%;

the total amount of non-hydraulic binding agents iii) is 0.1 to 20 wt.-%, preferably 0.5 to 15 wt.-%, more preferably 1 to 10 wt.-%;

the total amount of bittering agents iv) can be 0.001 to 3 wt.-%, preferably 0.1 to 2 wt.-%, more preferably 0.5 to 1 wt.-%;

the total amount of solvent v) can be 0.1 to 20 wt.-%, preferably 3 to 15 wt.-%, more preferably 5 to 10 wt.-%;

the total amount of additives vi) can be 0.1 to 10 wt.-%, preferably 0.5 to 5 wt.-%, more preferably 1 to 2 wt.-%,

the total amount of vii) can be 0.1 to 25 wt.-%, preferably 0.5 to 10 wt.-%, most preferably 2 to 7 wt.-%;

based on the total weight of the composition.

[0014] In various embodiments, the composition comprises as component i) 19 to 84 wt.-%, preferably 30 to 70 wt.-%, anionic surfactants and 1 to 15 wt.-%, preferably 3 to 10 wt.-%, non-ionic surfactants, based on the total weight of the composition; preferably these anionic surfactants are sulfonates and the nonionic surfactants are alcohol alkoxylates; more preferably these anionic surfactants are olefinic sulfonates and alkyl benzene sulfonates and the nonionic surfactants are fatty alcohol ethoxylates, most preferably C14 to C16 olefinic sulfonates are present in 5 to 50, or 10 to 30 wt.-%, or 15 to 20 wt.-% and the C10 to C13 alkyl benzene sulfonates are present in 20 to 40 wt.-%, more preferably 20 to 35 wt.-% and the C16 to C18 fatty alcohol ethoxylates having a degree of ethoxylation of greater than 8 EO are present in 1 to 15 wt.-%, preferably 3 to 10 wt.-%, based on the total weight of the composition.

[0015] In various embodiments, the at least one solvent v) comprises water and water is present in 0.1 to 10 wt.-%, preferably in 0.5 to 5 wt.-%, more preferably in 1 to 3 wt.-%, based on the total weight of the composition.

[0016] In various embodiments, the composition comprises less than 0.01 wt.-%, preferably less than 0.0001 wt.-%, more preferably less than 0.00001 wt.-% of titanium dioxide, based on the total weight of the composition, more preferably the composition is free of titanium dioxide.

[0017] In another aspect, the present invention also relates to a toilet rimblock comprising the composition described herein. Also encompassed is a toilet cleaning system comprising the toilet rimblock according to the invention and a release device.

[0018] The invention is furthermore directed to the use of the composition according to any one of the embodiments described herein as a toilet rimblock formulation for cageless release devices.

[0019] Further aspects of the invention are the use of a non-hydraulic binding agent in sanitary cleaning compositions for stabilizing the shape of a toilet rimblock and the use of a non-hydraulic binding agent for increasing child-safety of a toilet rimblock or solid detergent.

Surfactants

Anionic Surfactants

[0020] Suitable anionic surfactants for use in the composition may include, but are not limited to, aliphatic sulfates such as fatty alcohol sulfates, fatty alcohol ether sulfates, dialkyl ether sulfates, monoglyceride sulfates, and aliphatic sulfonates such as alkane sulfonates, ether sulfonates, n-alkyl ether sulfonates, ester sulfonates and lignin sulfonates. Fatty acid cyanamides, sulfosuccinates, particularly the C8 to C18 alkyl mono and diesters of succinic acid, sulfosuccinamates, sulfosuccinamides, fatty acid isethionates, acylaminoalkane sulfonates (fatty acid taurides), fatty acid sarcosinates, ether carboxylic acids and alkyl (ether) phosphates as well as alpha-sulfofatty acid salts, acylglutamates, monoglyc-

eride disulfates and alkyl ethers of glycerin disulfate can likewise be used in the context of the present invention.

[0021] The anionic surfactants preferably comprise fatty alcohol sulfates and/or fatty alcohol ether sulfates, in particular the fatty alcohol sulfates, in a preferred embodiment of the present invention. Fatty alcohol sulfates are products from sulfating reactions on corresponding alcohols, whereas fatty alcohol ether sulfates are products of sulfating reactions on alkoxyated alcohols. In the context of the present invention, alkoxyated alcohols are generally understood by the person skilled in the art to mean the reaction products of alkylene oxide, preferably ethylene oxide, with alcohols, preferably with the longer chain alcohols. As a rule, n moles of ethylene oxide react with one mole of alcohol to form, depending on the reaction conditions, a complex mixture of addition products with different degrees of ethoxylation. Another embodiment of the alkoxylation consists in the use of mixtures of the alkylene oxides, preferably a mixture of ethylene oxide and propylene oxide. Preferred fatty alcohol ether sulfates are the sulfates of low-ethoxyated fatty alcohols with 1 to 4 ethylene oxide units (EO), in particular 1 to 2 EO, for example 1.3 EO.

[0022] Exemplary useful anionic surfactants which may be used in the composition of the invention can be broadly described as the water-soluble salts, particularly the alkali metal salts, of organic sulfuric acid reaction products having in their molecular structure an alkyl or alkaryl radical containing from about 8 to about 22 carbon atoms and a radical selected from the group consisting of sulfonic acid and sulfuric acid ester radicals (Included in the term alkyl is the alkyl portion of higher acyl radicals). Suitable examples of the anionic surfactants which can be employed in the present invention are the sodium or potassium alkyl sulfates, especially those obtained by sulfating the higher alcohols (C8 to C18 carbon atoms) produced by reducing the glycerides of tallow or coconut oil; sodium or potassium alkyl benzene sulfonates, in which the alkyl group contains from about 9 to about 15 carbon atoms, (the alkyl radical can be a straight or branched aliphatic chain); paraffin sulfonate surfactants having the general formula RSO_3M , wherein R is a primary or secondary alkyl group containing from about 8 to about 22 carbon atoms (preferably 10 to 18 carbon atoms) and M is an alkali metal, e.g., sodium, lithium or potassium; sodium alkyl glyceryl ether sulfonates, especially those ethers of the higher alcohols derived from tallow and coconut oil; sodium coconut oil fatty acid monoglyceride sulfates and sulfonates; sodium or potassium salts of sulfuric acid esters of the reaction product of one mole of a higher fatty alcohol (e.g., tallow or coconut oil alcohols) and about 1 to 10 moles of ethylene oxide; sodium or potassium salts of alkyl phenol ethylene oxide ether sulfates with about 1 to about 10 units of ethylene oxide per molecule and in which the alkyl radicals contain from about 8 to about 12 carbon atoms; the reaction products of fatty acids esterified with isethionic acid and neutralized with sodium hydroxide where, for example, the fatty acids are derived from coconut oil; sodium or potassium salts of fatty acid amides of a methyl tauride in which the fatty acids, for example, are derived from coconut oil and sodium or potassium /3-acetoxy- or /3-acetamido-alkanesulfonates where the alkane has from 8 to 22 carbon atoms.

[0023] In a preferred embodiment the anionic surfactants comprise one or more linear alkyl benzene sulfonate surfactant wherein the alkyl portion contains 8 to 16 carbon atoms, and most preferably about 11 to 13 carbon atoms. A further preferred class of anionic surfactants are alpha olefin sulfonates, as well as salts thereof, e.g., alkali metal salts. Preferred are C9 to C22 alpha olefin sulfonates, particularly C12 to C18 as well as blends of two or more thereof. According to particularly preferred embodiments of the invention, the solid block compositions necessarily include an alpha olefin sulfonate anionic surfactant. Toluene and isopropylbenzene sulfonates are particularly preferred.

Nonionic Surfactants

[0024] Nearly any hydrophobic compound having a carboxy, hydroxy, amido, or amino group with a hydrogen group attached to the nitrogen can be condensed with an alkylene oxide, especially ethylene oxide or with the polyhydration product thereof, a polyalkylene glycol, especially polyethylene glycol, to obtain a water soluble or water dispersible nonionic surfactant compound.

[0025] In a preferred embodiment nonionic surfactants comprise alkoxyates such as polyglycol ethers, fatty alcohol polyglycol ethers, alkylphenol polyglycol ethers, end-capped polyglycol ethers, mixed ethers and hydroxy mixed ethers, and fatty acid polyglycol esters or mixtures thereof. Ethylene oxide/propylene oxide block polymers, fatty acid alkanolamides and fatty acid polyglycol ethers may be comprised as well. Another important class of nonionic surfactants that may be comprised are the polyol surfactants and in particular the glycol surfactants, such as alkyl polyglycosides and fatty acid glucamides. The alkyl polyglycosides are particularly preferred, in particular the alkyl polyglucosides as well as above all the fatty alcohol alkoxyates (fatty alcohol polyglycol ethers).

[0026] Preferred alcohol ethoxyates include the condensation products of aliphatic alcohols with 1 to 60 moles of an alkylene oxide, especially ethylene oxide. The alkyl chain of the aliphatic alcohol can either be straight or branched, primary or secondary, and generally contains from about 8 to about 22 carbon atoms. Examples of such ethoxyated alcohols include the condensation product of myristyl alcohol condensed with about 10 moles of ethylene oxide per mole of alcohol and the condensation product of about 9 moles of ethylene oxide with coconut alcohol (a mixture of fatty alcohols with alkyl chains varying in length from about 10 to 14 carbon atoms). Other examples are those C6 to C22 straight-chain alcohols having 3 to 6 moles of ethylene oxide. Commercially available products include Alfonic® 810-4.5, comprising C8 to C10 straight-chain alcohols having 4.85 moles EO (in the following EO is used as abbreviation for

ethoxylation units = degree of ethoxylation); Alifonic® 810-2, comprising C8 to C10 straight-chain alcohols having 2.1 moles EO; and Alifonic® 610-3.5, having 3.1 moles EO. Other examples of alcohol ethoxylates are C10 oxo-alcohol ethoxylates available from BASF under the Lutensol® ON tradenamelike Lutensol® ON 30; Lutensol® ON 50; Lutensol® ON 60; Lutensol® ON 65; Lutensol® ON 66; Lutensol® ON 70; Lutensol® ON 80; and Lutensol® ON 110. Other examples of ethoxylated alcohols include the Neodol® 91 series non-ionic surfactants available from Shell Chemical Company which are described as C9 to C11 ethoxylated alcohols, like Neodol® 91-2.5, Neodol® 91-6, and Neodol® 91-8. Neodol® 91-2.5 have been described as having about 2.5 EO; Neodol® 91-6 has been described as having about 6 EO; and Neodol® 91-8 has been described as having about 8 EO. Further examples of ethoxylated alcohols include the Rhodasurf® DA series non-ionic surfactants available from Rhodia which are described to be branched isodecyl alcohol ethoxylates, like Rhodasurf® DA-530 having 4 moles EO; Rhodasurf® DA-630 having 6 moles EO; and Rhodasurf® DA-639 is a 90% solution of DA-630. Further examples of ethoxylated alcohols include those from Tomah Products (Milton, WI) under the Tomadol®. A further class of useful nonionic surfactants include primary and secondary linear and branched alcohol ethoxylates, such as those based on C6 to C18 alcohols which further include an average of from 2 to 80 moles of ethoxylation per mol of alcohol. These examples include the Genapol® UD like Genapol® UD 030 with 3 EO; Genapol® UD 050 with 5 EO; Genapol® UD 070 with 7 EO; Genapol® UD 080 with 8 EO; Genapol® UD 088 with 8 EO; and Genapol® UD 110 with 11 EO. Exemplary useful nonionic surfactants include the condensation products of a secondary aliphatic alcohols containing 8 to 18 carbon atoms in a straight or branched chain configuration condensed with 5 to 30 moles of ethylene oxide, like commercially available under the trade name of Tergitol®. Examples include Tergitol 15-S-12 having 9 EO, or Tergitol 15-S-9 which having 12 EO.

[0027] Most preferred fatty alcohol alkoxyates are unbranched or branched, saturated or unsaturated C8 to C22 alcohols alkoxyated with ethylene oxide (EO) and/or propylene oxide (PO) with a degree of alkoxylation 2 to 30, preferably ethoxylated C12 to 22 fatty alcohols with a degree of ethoxylation of 10 to 30, preferably 12 to 28, particularly 20 to 28, particularly preferably 25, for example C16 to 18 fatty alcohol ethoxylates containing 25 EO.

[0028] Alkyl polyglycosides are surfactants that can be obtained by the reaction of sugars and alcohols using appropriate methods of preparative organic chemistry, whereby according to the method of preparation, one obtains a mixture of monoalkylated, oligomeric or polymeric sugars. They are for example commercially available under the trade name Pluronics® (ex. BASF). The compounds are formed by condensing ethylene oxide with a hydrophobic base formed by the condensation of propylene oxide with propylene glycol. The molecular weight of the hydrophobic portion of the molecule is of the order of 950 to 4,000 and preferably 200 to 2,500 g/mol. The measurement can be performed via GPC with polystyrene standards. The addition of polyoxyethylene radicals of the hydrophobic portion tends to increase the solubility of the molecule as a whole so as to make the surfactant water-soluble. Preferably, these surfactants are in liquid form at 25°C and particularly satisfactory surfactants are available as those marketed as Pluronics(R) L62 and Pluronics(R) L64. Preferred alkyl polyglycosides are the alkyl polyglucosides, wherein the alcohol is particularly preferably a long-chain fatty alcohol or a mixture of long-chain fatty alcohols with branched or unbranched C8 to C18 alkyl chains and the degree of oligomerization (DP) of the sugar is between 1 and 10, advantageously 1 to 6, particularly 1.1 to 3, most preferably 1.1 to 1.7, for example C8 to 10 alkyl-1.5-glucoside (DP of 1.5). Their preparation is known to the skilled person. Exemplary methods can be found in K. Hill, W. von Rybinski, G. Stoll "Alkyl Polyglycosides, Technology, Properties and Applications", VCH, 1996.

[0029] Fatty alcohol ethoxylates are preferably employed in amounts of 0.1 to 20 wt.-%, particularly preferably 4 to 12 wt.-%, and particularly preferably from 7 to 9 wt.-%, based on the total weight of the composition. Additional nonionic surfactants, such as fatty acid monoalkanolamides and/or alkyl polyglycosides, may be included in amounts of 0.1 to 10 wt.-%, preferably 2 to 6 wt.-%, based on the total weight of the composition.

[0030] In a preferred embodiment the nonionic surfactants can comprise polyalkylene oxide condensates of alkyl phenols. These compounds include the condensation products of alkyl phenols having an alkyl group containing from about 6 to 12 carbon atoms in either a straight chain or branched chain configuration with an alkylene oxide, especially an ethylene oxide, the ethylene oxide being present in an amount equal to 5 to 25 moles of ethylene oxide per mole of alkyl phenol. The alkyl substituent in such compounds can be derived, for example, from polymerized propylene, diisobutylene and the like. Examples of compounds of this type include nonyl phenol condensed with about 9.5 moles of ethylene oxide per mole of nonyl phenol; dodecylphenol condensed with about 12 moles of ethylene oxide per mole of phenol; dinonyl phenol condensed with about 15 moles of ethylene oxide per mole of phenol and diisooctyl phenol condensed with about 15 moles of ethylene oxide per mole of phenol.

[0031] The nonionic surfactants can alternatively be alkoxyated alkanolamides, preferably C8 to C24 alkyl di(C2 to C3 alkanol amides), as described in WO 2007148054 A1.

[0032] Alternatively, the nonionic surfactants preferably comprise nonionic amine oxide surfactants. Exemplary amine oxides include: A) Alkyl di (lower alkyl) amine oxides in which the alkyl group has about 10 to 20, and preferably 12 to 16 carbon atoms, and can be straight or branched chain, saturated or unsaturated. The lower alkyl groups include between 1 and 7 carbon atoms.

[0033] Examples include lauryl dimethyl amine oxide, myristyl dimethyl amine oxide, and those in which the alkyl group

is a mixture of different amine oxide, dimethyl cocoamine oxide, dimethyl (hydrogenated tallow) amine oxide, and myristyl/palmityl dimethyl amine oxide; B) Alkyl di (hydroxy lower alkyl) amine oxides in which the alkyl group has about 10 to 20, and preferably 12 to 16 carbon atoms, and can be straight or branched chain, saturated or unsaturated.

[0034] Besides the previously cited surfactant types, the composition according to the invention may also comprise cationic surfactants and/or amphoteric surfactants.

[0035] A cationic surfactant may be incorporated as a germicide or as a deterative surfactant in the composition of the present invention, particularly when a bleach constituent is absent from the solid block composition. Cationic surfactants are per se, well known, and exemplary useful cationic surfactants may be one or more of those described for example in McCutcheon's Functional Materials, Vol.2, 1998; Kirk-Othmer, Encyclopedia of Chemical Technology, 4th Ed., Vol. 23, pp. 481-541 (1997).

[0036] Examples of preferred cationic surfactants are those which provide a germicidal effect to the concentrate compositions, and especially preferred are quaternary ammonium compounds and salts thereof.

[0037] Exemplary quaternary ammonium salts include the alkyl ammonium halides such as cetyl trimethyl ammonium bromide, alkyl aryl ammonium halides such as octadecyl dimethyl benzyl ammonium bromide, N-alkyl pyridinium halides such as N-cetyl pyridinium bromide, and the like. Other suitable types of quaternary ammonium salts include those in which the molecule contains either amide, ether or ester linkages such as octyl phenoxy ethoxy ethyl dimethyl benzyl ammonium chloride, N-(laurylcocoaminoformylmethyl)-pyridinium chloride, and the like. Other very effective types of quaternary ammonium compounds which are useful as germicides include those in which the hydrophobic radical is characterized by a substituted aromatic nucleus as in the case of lauryloxyphenyltrimethyl ammonium chloride, cetylaminophenyltrimethyl ammonium metho sulfate, dodecylphenyltrimethyl ammonium metho sulfate, dodecylbenzyltrimethyl ammonium chloride, chlorinated dodecylbenzyltrimethyl ammonium chloride, and the like.

Filler

[0038] Suitable filler include any soluble inorganic alkali, alkaline earth metal salt or hydrate thereof, for example, chlorides such as sodium chloride, magnesium chloride and the like, carbonates and bicarbonates such as sodium carbonate, sodium bicarbonate and the like, sulfates such as magnesium sulfate, copper sulfate, sodium sulfate, zinc sulfate and the like, borax, borates such as sodium borate and the like.

[0039] The inventive compositions can further optionally include 0.1 to 15 wt.-%, preferably 0.5 to 5 wt.-% of a non-salt filler material, based on the total weight of the composition. Such fillers are typically particulate solid water-insoluble materials which may be based on inorganic materials such as talc, titanium dioxide or silica, particulate organic polymeric materials such as finely comminuted water insoluble synthetic polymers.

Non-hydraulic binding agent

[0040] Typical for non-hydraulic binding agents is that hardening takes place only at air and not in water. In contrast to that hydraulic binders, like cement, harden even underwater.

[0041] In a preferred embodiment the non-hydraulic binding agent comprises a compound selected from clay; gypsum, like calcium sulfate dehydrate; non-hydraulic lime; amorphous calcium oxide; amorphous magnesium oxide; fireclay mortar; magnesium oxychloride cement; white lime; phosphate binder; soluble glass; or slaked lime; or mixtures thereof preferably wherein the non-hydraulic binding agent comprises at least one compound selected from gypsum, like calcium sulfate dehydrate; non-hydraulic lime; amorphous calcium oxide; amorphous magnesium oxide; fireclay mortar; magnesium oxychloride cement; white lime; phosphate binder; soluble glass; or slaked lime; or mixtures thereof; more preferably the non-hydraulic binding agent comprises gypsum.

[0042] By adding the non-hydraulic binding agent it has been surprisingly found that a relatively hard composition can be obtained which is still homogeneously dissolvable.

Bittering agent

[0043] Bittering agents are known in the field of cleaning products like laundry detergents or hard surface cleaning compositions. For example suitable bittering agents are disclosed in WO2014/026855 A1 and WO2014/026856 A1 to which reference is explicitly made. The addition of bittering agent to the composition leads to a further increase of child safety of the product.

[0044] Examples of suitable glycosides are flavonoids such as quercetin or naringin, iridoid glycosides such as aucubin, and in particular secoiridoid glycosides such as amarogentin, dihydrofoliamentin, gentiopicroside, gentiopicrin, swertia-marin, sweroside, gentioflavoside, centaurosides, metafolin, harpagoside, and centapicine, salicin, or conduranguin.

[0045] Isoprenoids are compounds which are formally derived from isoprene. Examples are in particular terpenes and terpenoids.

[0046] Examples of suitable isoprenoids include sesquiterpene lactones such as absinthin, artabsin, cnicin, lactucin, lactucopicrin, or salonitenolid, monoterpene ketones (thujones) such as alpha -thujone or beta -thujone, tetranortriterpenes (limonoids) such as deoxylimonene, deoxylimonenic acid, limonene, ichangin, isoobacunonic acid, obacunone, obacunonic acid, nomilin, or nomilinic acid, and terpenes such as marrubin, premarrubin, carnosol, carnosolic acid, or quassin.

[0047] Alkaloids refer to naturally occurring, chemically heterogeneous, usually alkaline, nitrogen-containing organic compounds of the secondary metabolism which act on the animal or human organism. Examples of suitable alkaloids include quinine hydrochloride, quinine hydrogen sulfate, quinine dihydrochloride, quinine sulfate, columbin, and caffeine.

[0048] Examples of suitable amino acids include threonine, methionine, phenylalanine, tryptophan, arginine, histidine, valine, and asparagic acid.

[0049] Particularly preferred bittering agents having a bitterness value between 1,000 and 200,000 are quinine sulfate (bitterness value=10,000), naringin (bitterness value=10,000), saccharose octaacetate (bitterness value=100,000), quinine hydrochloride, and mixtures thereof.

[0050] The bitterness value is the reciprocal value of the dilution of an agent in a solvent or an extraction which barely tastes bitter.

[0051] The method to determine the bitterness value is disclosed in "Europäischen Arzneibuch (5. Ausgabe Grundwerk, Stuttgart 2005, Band 1 Allgemeiner Teil Monografiegruppen, 2.8.15 Bitterwert S. 278). In the measurement the comparative value is an aqueous solution of quinine hydrochloride whose bitterness value is determined at 200,000. This means that 1g of quinine hydrochloride turns 200 liter water bitter. The individual differences in taste in the organoleptic assessment of the bitterness are in this method are balanced through a correction value.

Solvent

[0052] In preferred embodiments the at least one solvent comprises compounds selected from water, alcohols, alkyl ether, C5 to C20 alkanes, glycol like diethylene glycol and dipropylene glycol, and glycerol. In more preferred embodiments the at least one solvent comprises water.

Additive

Acids

[0053] The compositions according to the invention may comprise one or more acids and/or their salts to increase the cleaning power against lime scale and urine scale. Organic acids, such as formic acid, acetic acid, citric acid, glycolic acid, lactic acid, succinic acid, adipic acid, malic acid, tartaric acid and gluconic acid as well as their mixtures are particularly suitable as the acids for the present invention. In addition, the mineral acids hydrochloric acid, sulphuric acid, phosphoric acid and nitric acid or even amido sulfonic acid or their mixtures can also be employed. The acids and/or their salts are preferably selected from the group consisting of citric acid, and lactic acid, any of their salts, and mixtures thereof. They are preferably employed in amounts of 0.01 to 10 wt.-%, and particularly preferably from 0.2 to 5 wt.-%, based on the total weight of the composition.

Bases

[0054] Additionally, various alkalis may be included in the inventive compositions. Those alkaline materials selected from the group of alkali metal and alkaline earth metal hydroxides and carbonates, especially sodium carbonate or sodium hydroxide, are preferably employed in the compositions as bases. In addition however, ammonia and/or alkanolamines with 1 to 9 carbon atoms in the molecule can be used, preferably the ethanolamines, and especially monoethanolamine.

Antimicrobial Agents

[0055] Disinfection and sanitation represent a particular aspect of cleaning. Accordingly, in an additional embodiment of the invention, the composition according to the invention comprises one or more antimicrobial agents, preferably in an amount of 0.01 to 1 wt.-%, advantageously 0.02 to 0.8.-wt %, especially 0.05 to 0.5.-wt %, particularly preferably 0.1 to 0.3 wt.-%, and most preferably 0.2 wt.-%, based on the total weight of the composition.

[0056] In the present invention, the definition of antimicrobial agents does not include cationic surfactants, which however can have an antimicrobial function. In the context of the invention, the terms disinfection, sanitation, antimicrobial action and antimicrobial agent have the usual technical meaning. Whereas disinfection in the strictest sense of medical practice means the killing of -- theoretically all -- infectious germs, in sanitation it is understood to mean the greatest

possible elimination of all -- even the saprophytic germs that are normally not harmful to humans. Here the degree of disinfection or sanitation depends on the antimicrobial action of the composition used which decreases with decreasing content of antimicrobial agent or increasing dilution of the composition used.

[0057] Suitable exemplary antimicrobial agents are preferably selected from the group consisting of alcohols, amines, aldehydes, antimicrobial acids and salts thereof, carboxylic acid esters, acid amides, phenols, phenol derivatives, diphenyls, diphenylalkanes, urea derivatives, oxygen and nitrogen acetals and formals, benzamides, isothiazolines, phthalimide derivatives, pyridine derivatives, antimicrobial surface-active compounds, guanidines, antimicrobial amphoteric compounds, quinolines, 1,2-dibromo-2,4-dicyanobutane, iodo-2-propynyl butyl carbamate, iodine, iodophores, compounds that split off active chlorine, peroxides, and mixtures thereof. Preferred antimicrobial agents are preferably selected from the group consisting of ethanol, n-propanol, i-propanol, 1,3-butanediol, phenoxyethanol, 1,2-propylene glycol, glycerin, undecylenic acid, citric acid, lactic acid, benzoic acid, salicylic acid, thymol, 2-benzyl-4-chlorophenol, 2,2'-methylenebis-(6-bromo-4-chlorophenol), 2,4,4'-trichloro-2'-hydroxydiphenyl ether, N-(4-chlorophenyl)-N-(3,4-dichlorophenyl) urea, N,N'-(1,10-decanediyl-di-1-pyridinyl-4-ylidene)bis-(1-octanamine)dihydrochloride, N,N'-bis-(4-chlorophenyl)-3,12-diimino-2,4,11,13-tetraazatetradecanediiimidamide, guanidine and sodium dichloroisocyanurate (DCI, 1,3-dichloro-5H-1,3,5-triazine-2,4,6-trione sodium salt), and mixtures thereof. Furthermore, antimicrobially active ethereal oils can also be employed that simultaneously provide a perfuming benefit. Particularly preferred antimicrobial agents are selected from the group consisting of salicylic acid, especially benzalkonium chloride, peroxy compounds, especially hydrogen peroxide, alkali metal hypochlorite, sodium dichloroisocyanurate, and mixtures thereof.

Preservatives

[0058] Preservatives may also be incorporated in the compositions according to the invention. Essentially, the substances cited above as antimicrobial agents may also function as preservatives.

Chelating Agents

[0059] The INCI term chelating agents, also known as sequestrants, are ingredients that are capable of complexing and inactivating metal ions so as to prevent their detrimental action on the stability or on the appearance of the agent, e.g. turbidity. It is important to complex the calcium and magnesium ions in hard water as they are incompatible with numerous ingredients. The complexation of the ions of heavy metals such as iron or copper also retards the oxidative decomposition of the finished composition. In addition, the chelating agents support the cleaning action.

[0060] The following exemplary chelating agents named according to INCI are suitable: aminotrimethylene phosphonic acid, beta-alanine diacetic acid, calcium disodium EDTA, citric acid, cyclodextrin, cyclohexanediamine tetraacetic acid, diammonium citrate, diammonium EDTA, diethylenetriamine pentamethylene phosphonic acid, dipotassium EDTA, disodium azacycloheptane diphosphonate, disodium EDTA, disodium pyrophosphate, EDTA, etidronic acid, galactaric acid, gluconic acid, glucuronic acid, HEDTA, hydroxypropyl cyclodextrin, methyl cyclodextrin, pentapotassium triphosphate, pentasodium aminotrimethylene phosphonate, pentasodium ethylenediamine tetramethylene phosphonate, pentasodium pentetate, pentasodium triphosphate, pentetic acid, phytic acid, potassium citrate, potassium EDTMP, potassium gluconate, potassium polyphosphate, potassium trisphosphonomethylamine oxide, ribonic acid, sodium chitosan methylene phosphonate, sodium citrate, sodium diethylenetriamine pentamethylene phosphonate, sodium dihydroxyethylglycinate, sodium EDTMP, sodium gluceptate, sodium gluconate, sodium glycereth-1 polyphosphate, sodium hexametaphosphate, sodium metaphosphate, sodium metasilicate, sodium phytate, sodium polydimethylglycinophenolsulfonate, sodium trimetaphosphate, TEA-EDTA, TEA-polyphosphate, tetrahydroxyethyl ethylenediamine, tetrahydroxypropyl ethylenediamine, tetrapotassium etidronate, tetrapotassium pyrophosphate, tetrasodium EDTA, tetrasodium etidronate, tetrasodium pyrophosphate, tripotassium EDTA, trisodium dicarboxymethyl alaninate, trisodium EDTA, trisodium HEDTA, trisodium NTA and trisodium phosphate.

Polymers

[0061] The compositions according to the invention can further comprise polymers. They can act, for example, to reduce the formation of lime scale as well as the propensity to resoiling.

[0062] In this regard, preferred polymers are acrylic polymers, such as those commercially available from Rhodia under the trade name Mirapol (Registered trademark).

Colorants

[0063] The composition according to the invention can comprise one or more colorants as additional ingredients. Both water-soluble as well as oil-soluble colorants can be used as the colorants. In the selection of suitable colorants one

has to take care of the compatibility with other ingredients present, for example bleaching agents, and one has to ensure added colorant does not substantively stain the toilet ceramics, even after long periods of action. The colorants are preferably incorporated in an amount of 0.0001 to 0.1 wt %, particularly in an amount of 0.0005 to 0.05 wt %, and particularly preferably from 0.001 to 0.01 wt %.

Builders

[0064] Water-soluble and/or water-insoluble builders can optionally be employed in the compositions according to the invention. Here, water-soluble builders are preferred, as they generally have less of a tendency to leave behind insoluble residues on hard surfaces. Conventional builders which may be present in accordance with the invention include low molecular weight polycarboxylic acids and salts thereof, the homopolymeric and copolymeric polycarboxylic acids and salts thereof, citric acid and salts thereof, carbonates, phosphates and silicates. Water-insoluble builders include the zeolites, which can also be used, as well as mixtures of the above described builder substances.

Bleaching Agents

[0065] Bleaching agents may also be included to the compositions of the present invention. Suitable bleaching agents include peroxides, peracids and/or perborates. Particularly preferably for use herein is hydrogen peroxide. In contrast, sodium hypochlorite is less suitable in acidic cleaning agents due to the release of poisonous chlorine gas vapor, but can be employed in cleaning agents adjusted to alkaline pH. In certain circumstances a bleach activator can also be used in addition to the bleaching agent.

Corrosion Inhibitors

[0066] Corrosion inhibitors are for example the following substances named according to INCI and can be present in the composition of the present invention: Cyclohexylamine, Diammonium Phosphate, Dilithium Oxalate, Dimethylamino Methylpropanol, Dipotassium Oxalate, Dipotassium Phosphate, Disodium Phosphate, Disodium Pyrophosphate, Disodium Tetrapropenyl Succinate, Hexoxyethyl Diethylammonium, Phosphate, Nitromethane, Potassium Silicate, Sodium Aluminate, Sodium Hexametaphosphate, Sodium Metasilicate, Sodium Molybdate, Sodium Nitrite, Sodium Oxalate, Sodium Silicate, Stearamidopropyl Dimethicone, Tetrapotassium Pyrophosphate, Tetrasodium Pyrophosphate, Triisopropanolamine.

Flush Regulators

[0067] The substances designated as flush regulators act primarily to control the consumption of the agent during use in such a way that the intended lifetime is optimized. Solid long-chain fatty acids, such as stearic acid, are preferred regulators. Also fatty acid ethanolamides, such as coco fatty acid monoethanolamide, or solid polyethylene glycols, such as those having number average molecular weights between 10,000 and 50,000, are suitable flush regulators. Those can be present in the composition of the present invention.

Adhesion Inhibitors

[0068] When manufacturing the composition according to the invention, an adhesion inhibitor can be added to improve the processability. Preferred adhesion inhibitors are dolomite powder or titanium dioxide powder of fine particle size distribution. They improve the processability when shaping the product into spheres, and markedly reduces both attrition and tack.

[0069] The results with such agents are better than with other conventional measures, for example coating the sphere with a lubricant, dusting or coating the shaping rollers with Teflon.

Enzymes

[0070] The agent can also comprise enzymes, for example proteases, lipases, amylases, hydrolases and/or cellulases. The enzymes can be added to the composition in each form established according to the prior art. These include solutions of the enzyme, advantageously as concentrated as possible, anhydrous and/or with added stabilizers. Alternatively, the enzymes can be encapsulated, for example by spray drying or extrusion of the enzyme solution together with a preferably natural polymer or in the form of capsules, for example those in which the enzyme is embedded in a solidified gel, or in those of the core-shell type, in which an enzyme-containing core is coated with a water-, air- and/or chemical-impervious protective layer. Further active agents, for example stabilizers, emulsifiers, pigments, bleaches or colorants can be

applied in additional layers. Such capsules are made using known methods, for example by vibratory granulation or roll compaction or by fluidized bed processes. Advantageously, these types of granulates, for example with a coated polymeric film former, are dust-free and as a result of the coating are storage stable.

[0071] In addition, enzyme stabilizers can be present in the enzyme-containing agent, in order to protect an enzyme comprised in an agent according to the invention against damage such as for example inactivation, denaturing or decomposition for example by physical effects, oxidation or proteolytic cleavage. Each depending on the enzyme used, the following are suitable as enzyme stabilizers: benzamidine hydrochloride, borax, boric acid, boronic acids or their salts or esters, primarily derivatives containing aromatic groups, for example substituted phenylboronic acids or their salts or esters; peptide aldehydes (oligopeptides with reduced C-terminus), amino alcohols such as mono, di, triethanolamine and mono, di, tripropanolamine and their mixtures, aliphatic carboxylic acids up to C12, such as succinic acid, other dicarboxylic acids or salts of the cited acids, end blocked fatty acid amide alkoxylates; aliphatic lower alcohols and primarily polyols, for example glycerin, ethylene glycol, propylene glycol or sorbitol, as well as reducing agents and antioxidants such as sodium sulfite and reducing sugars. Further suitable stabilizers are known from the prior art. The use of combinations of stabilizers is preferred, for example the combination of polyols, boric acid and/or borax, the combination of boric acid or borate, reducing salts and succinic acid or other dicarboxylic acids or the combination of boric acid or borate with polyols or polyamino compounds and with reducing salts.

Fragrance components and/or perfume

[0072] The composition preferably comprises one or more fragrance components and/or perfume, in the following referred to fragrances as well, in an amount of 0.01 to 10 wt %, preferably 0.05 to 8 wt %, particularly preferably 0.1 to 5 wt %, based on the total weight of the composition. In this regard for example, d-limonene may be utilized as the perfume component. In a particularly preferred embodiment, the composition according to the invention comprises a perfume based on ethereal oils (also known as essential oils). In the context of this invention, pine-, citrus-, jasmine-, patchouly-, rose- or Ylang-Ylang-oil are exemplary oils. Also suitable are muscatel sage oil, chamomile oil, lavender oil, clove oil, melissa oil, mint oil, cinnamon leaf oil, lime blossom oil, juniper berry oil, vetiver oil, olibanum oil, galbanum oil and laudanum oil and orange blossom oil, neroli oil, orange peel oil and sandalwood oil.

[0073] The volatility of an odoriferous substance is crucial for its perceptibility, whereby in addition to the nature of the functional groups and the structure of the chemical compound, the molecular weight also plays an important role. Thus, the majority of odoriferous substances have molecular weights up to about 200 daltons, whereas molecular weights of 300 daltons and above are quite an exception. Due to the different volatilities of odoriferous substances, the smell of a perfume composed of a plurality of odoriferous substances changes during evaporation, the impressions of odor being subdivided into the "top note", "middle note" or "body" and "end note" or "dry out".

[0074] Exemplary tenacious odorous substances that are advantageously utilizable in the perfume oils in the context of the present invention are the ethereal oils such as angelica root oil, aniseed oil, arnica flowers oil, basil oil, bay oil, bergamot oil, champax blossom oil, silver fir oil, silver fir cone oil, elemi oil, eucalyptus oil, fennel oil, pine needle oil, galbanum oil, geranium oil, ginger grass oil, guaiacum wood oil, Indian wood oil, helichrysum oil, ho oil, ginger oil, iris oil, cajuput oil, sweet flag oil, camomile oil, camphor oil, Canoga oil, cardamom oil, cassia oil, Scotch fir oil, copaiba balsam oil, coriander oil, spearmint oil, caraway oil, cumin oil, lavender oil, lemon grass oil, limette oil, mandarin oil, melissa oil, amber seed oil, myrrh oil, clove oil, neroli oil, niaouli oil, olibanum oil, orange oil, organum oil, Palma Rosa oil, patchouli oil, Peru balsam oil, petit grain oil, pepper oil, peppermint oil, pimento oil, pine oil, rose oil, rosemary oil, sandalwood oil, celery seed oil, lavender spike oil, Japanese anise oil, turpentine oil, thuja oil, thyme oil, verbena oil, vetiver oil, juniper berry oil, wormwood oil, wintergreen oil, ylang-ylang oil, ysope oil, cinnamon oil, cinnamon leaf oil, citronella oil, citrus oil and cypress oil.

[0075] However, in the context of the present invention, the higher boiling or solid fragrances of natural or synthetic origin can also be used as the tenacious fragrances or mixtures of fragrances in the perfume oils. These compounds include the following compounds and their mixtures: ambrettolide, alpha -amyl cinnamaldehyde, anethol, anisaldehyde, anis alcohol, anisole, methyl anthranilate, acetophenone, benzyl acetone, benzaldehyde, ethyl benzoate, benzophenone, benzyl alcohol, benzyl acetate, benzyl benzoate, benzyl formate, benzyl valerate, borneol, bornyl acetate, alpha -bromostyrene, n-decyl aldehyde, n-dodecyl aldehyde, eugenol, eugenol methyl ether, eucalyptol, farnesol, fenchone, fenchyl acetate, geranyl acetate, geranyl formate, heliotropin, methyl heptyne carboxylate, heptaldehyde, hydroquinone dimethyl ether, hydroxycinnamaldehyde, hydroxycinnamyl alcohol, indole, irone, isoeugenol, isoeugenol methyl ether, isosafrol, jasmone, camphor, carvacrol, carvone, p-cresol methyl ether, coumarone, p-methoxyacetophenone, methyl n-amyl ketone, methyl anthranilic acid methyl ester, p-methyl acetophenone, methyl chavicol, p-methyl quinoline, methyl beta -naphthyl ketone, methyl n-nonyl acetaldehyde, methyl n-nonyl ketone, muscone, beta - naphthol ethyl ether, beta -naphthol methyl ether, nerol, nitrobenzene, n-nonyl aldehyde, nonyl alcohol, n-octyl aldehyde, p-oxyacetophenone, pentadecanolid, beta -phenylethyl alcohol, phenyl acetaldehyde dimethyl acetal, phenyl acetic acid, pulegone, safrol, isoamyl salicylate, methyl salicylate, hexyl salicylate, cyclohexyl salicylate, santalol, scatol, terpineol, thymine, thymol,

gamma -undecalactone, vanillin, veratrum aldehyde, cinnamaldehyde, cinnamyl alcohol, cinnamic acid, ethyl cinnamate, benzyl cinnamate.

[0076] In the context of the present invention, the fragrances of higher volatility include the lower boiling fragrances of natural or synthetic origin that can be used alone or in mixtures. Exemplary readily volatile odoriferous substances include alkyl isothiocyanates (alkyl mustard oils), butanedione, limonene, linalool, linalyl acetate and linalyl propionate, menthol, menthone, methyl-n-heptenone, phellandrene, phenyl acetaldehyde, terpinyl acetate, citral, and citronellal.

Multi-Layer Toilet Cleaning Blocks

[0077] It is known from the prior art, for example in EP 791047 B1, to manufacture compositions from compounds of different compositions, wherein one of the compounds is totally or partially encapsulated by one or more of the other compounds. Thus for example, the inner compound can possess a higher perfume concentration than the outer compound in order to ensure a constant fragrance impression with a diminishing sphere weight over the service life of the product. The inner compound may also comprise a different fragrance than the outer compound. Alternatively, other active substances can also be incorporated in different layers such that they release at different times depending on the extent of flush. This type of layered construction is also possible for compositions according to the invention.

Process for obtaining a toilet rimblock

[0078] A toilet rimblock can be obtained by extruding the composition in a conventional extruder and subsequently cutting the extrudate into pieces of a desired size. This is a known process for the person skilled in the art. The toilet rimblock can as well be formed into a spherical shape in a process including the steps:

- a) mixing the ingredients;
- b) extruding the mixture;
- c) cutting the extruded strand into pieces of a defined mass; and
- d) shaping into rotationally symmetric objects.

[0079] The shaping step (d) is preferably carried out in a ball rolling machine or in a press. Other suitable shaping processes include casting and calendaring. Steps (a) and (b) can also be combined by mixing the ingredients in the extruder. The process steps optionally proceed at different temperatures, such that heating or cooling steps can also be interposed between the steps as necessary.

[0080] In a preferred embodiment, subsequent to one of the steps (b) or (c), an additional process step is carried out in which the extruded strand is provided with a lubricant. For this a sponge, in the form of a roller that is permanently charged with the lubricant, is guided over the extruded strand such that the surface is completely or partially, preferably to 10 to 40%, covered with lubricant. The addition of lubricant improves the subsequent molding into the spherical shape. Suitable lubricants are especially substances that for example are added as surfactants or flush regulators in inventive formulations. In this regard, an added lubricant is preferably selected from the group consisting of dipropylene glycol, paraffins, non-ionic surfactants, polyethylene glycols, and mixtures thereof, and especially dipropylene glycol.

EXAMPLES

[0081]

Ingredient (wt.-%)	Ex. 1	Comparative Ex. 2
Alpha olefin sulfonate	15.5	15.5
Alkyl benzene sulfonate	30.5	30.5
Fatty alcohol ethoxylate (C16 to C18; 25 EO)	5	5
gypsum	5	/
NaSO ₄	37,5	42,5
Trisodium dihydrate	1	1
colorant	0.02	0.02

(continued)

Ingredient (wt.-%)	Ex. 1	Comparative Ex. 2
Dipropylene glycol	0.7	0.7
water	0.7	0.7
perfum	4	4

[0082] The compositions were extruded and subsequently left to harden for 24 hours. The thus obtained rimblock of example 1 was hard enough so that only by employing strong pressure a bigger part broke away. Hand pressure was not sufficient to deform the obtained rimblock. Additionally the rimblock was flushed evenly and showed a homogenous dissolution. In contrast, the composition of comparative Example 2 was still soft after 24 hours. By employing hand pressure only the block was squeezed and it was possible to crumble the block into little pieces.

Claims

1. A composition for lavatory cleaning comprising:

- i) at least one surfactant;
- ii) at least one filler;
- iii) at least one non-hydraulic binding agent;
- iv) optionally at least one bittering agent;
- v) optionally at least one solvent;
- vi) optionally at least one additive; and
- vii) optionally fragrance components and/or a perfume.

2. The composition according to claim 1, wherein

- i) comprises at least one anionic surfactant.

3. The composition according to claim 1 or 2, wherein ii) comprises at least one filler selected from sulfate and carbonate fillers or a combination thereof.

4. The composition according to any one of claims 1 to 3, wherein iii) comprises at least one non-hydraulic binding agent selected from clay; gypsum, like calcium sulfate dehydrate; non-hydraulic lime; amorphous calcium oxide; amorphous magnesium oxide; fireclay mortar; magnesium oxychloride cement; white lime; phosphate binder; soluble glass; or slaked lime or combinations thereof.

5. The composition according to any one of claims 1 to 4, iv) has a bitterness value of from 1,000 to 200,000.

6. The composition according to any one of claims 1 to 5, wherein v) comprises at least one solvent selected from water, alcohols, C5 to C20 alkanes, glycols like diethylene glycol and dipropylene glycol, and glycerol.

7. The composition according to any one of claims 1 to 6, wherein vi) comprises at least one additive selected from acids, bases, antimicrobial agents, thickening agents, corrosion inhibitors, flush regulators, enzymes, microorganisms, biofilm reducing agents, limescale reducing agents, pigments, colorants, or dyes or combinations thereof.

8. The composition according to any one of claims 1 to 7, wherein
the total amount of surfactants i) is 20 to 85 wt.-%;
the total amount of fillers ii) is 10 to 70 wt.-%;
the total amount of non-hydraulic binding agents iii) is 0.1 to 20 wt.-%;
the total amount of bittering agents iv) can be 0.001 to 3 wt.-%;
the total amount of solvent v) can be 0.1 to 20 wt.-%;
the total amount of additives vi) can be 0.0001 to 10 wt.-%;
the total amount of vii) can be 0.1 to 25 wt.-%;
based on the total weight of the composition.

9. The composition according to claim 8, wherein

i) comprises 19 to 84 wt.-% anionic surfactants and 1 to 15 wt.-% non-ionic surfactants, based on the total weight of the composition.

10. The composition according to any of claims 1 to 9, wherein v) the at least one solvent comprises water.

11. A toilet rimblock comprising the composition according to any one of claims 1 to 10

12. A toilet cleaning system comprising the composition according to claim 11 and a release device.

13. Use of the composition according to any one of claims 1 to 10 as a toilet rimblock formulation for cageless release devices.

14. Use of a non-hydraulic binding agent in sanitary cleaning compositions for stabilizing the shape of a toilet rimblock.

15. Use of a non-hydraulic binding agent for increasing child-safety of a toilet rimblock or solid detergent.



EUROPEAN SEARCH REPORT

Application Number
EP 17 16 9474

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