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(54) Title: METHOD FOR INCREASING THE EFFICACY OF AN ODOR MASKING AGENT

(57) Abstract

The efficacy of an odor masking or odor repressing agent in an aqueous cleaning composition containing a disinfectant such as a bactericide can be improved by incorporating a nonionic sugar surfactant into an aqueous composition which contains a compound having anti-bacterial activity and an odor-masking agent.

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METHOD FOR INCREASING THE EFFICACY OF AN ODOR MASKING AGENT

BENEFIT OF EARLIER FILING DATE UNDER 37 CFR 1.78(A)(4)

This application claims the benefit of earlier filed and copending provisional application serial number 60/000,380 filed on June 21, 1995.

BACKGROUND OF THE INVENTION

1. Field of the Invention

This invention relates to compositions and methods which reduce the unpleasant odor of cleaning compositions containing disinfectants. The invention further relates to odor masking compositions for disinfectant cleaning compositions, to a method of increasing the efficacy of an odor masking or odor repressing agent, and to the use of odor-masked disinfectant compositions in disinfectant cleaning compositions.

2. Background Art

Cleaning compositions such as personal cleansing preparations, hand and machine dishwashing detergents, hard surface cleaners, and liquid and solid laundry detergents which contain disinfectants such as bactericides or bacteriostats are becoming more widespread.

Phenol derivatives are a common class of disinfectants used in cleaning compositions. See e.g. "Disinfectants and Antiseptics", Encyclopedia of Chemical Technology, vol. 7, pp. 808-815 (Kirk-Othmer, eds., John Wiley & Sons, Inc. N.Y., N.Y., 3d ed. 1979). As this article states, phenol itself is of mostly historical interest or as a research tool in microbiology. The disinfectant art progressed to homologues of phenol, halogenated phenols, halogenated homologues, dihydric and trihydric phenols, hydroxybenzoic acids, bis(hydroxyphenyl)alkanes, and hydroxyquinolines. For example, 3,5-dimethyl-4-chlorophenol is discussed at pages 810 and 811 of that article and 2,4,4'-trichloro-2'-hydroxydiphenyl ether is discussed at page 812.

One of the major problems associated with the use of phenolic disinfectants in cleaning compositions is their unpleasant and undesirable odor. In order to overcome the odor problem, odor masking or odor repressing agents are incorporated into cleaning compositions. Besides masking the odor of the disinfectants, such compounds can also mask the odor of perfumes used to enhance the aesthetic value of the cleaning compositions. In addition, the amounts of odor masking or odor repressing agents necessary to mask the odor of the disinfectants increases the cost of the cleaning products.

SUMMARY OF THE INVENTION

This invention relates to compositions and methods which reduce the unpleasant odor of cleaning compositions containing disinfectants. One aspect of the present invention is a method for reducing the unpleasant odor of disinfectant cleaning compositions by increasing the efficacy of an odor masking or odor repressing agent in an aqueous cleaning composition containing a disinfectant such as a bactericide. The compositions according to the invention contain a nonionic sugar surfactant such as an alkyl glucose ester, an aldobionamide, a gluconamide, a glyceramide, a glyceroglycolipid and polyhydroxy fatty acid amide surfactant, an alkyl polyglycoside or any combination of such surfactants and a compound having anti-bacterial activity selected from the group consisting of halo-substituted monohydric phenol compounds, halo-substituted dihydric phenol compounds, halo-substituted trihydric phenol compounds, halo-substituted hydroxybenzoic acids, halo-

substituted bis(hydroxyphenyl)alkanes and quaternary ammonium bromides selected from the group consisting of lauryl dimethylbenzyl ammonium bromide, alkyl trimethyl ammonium bromide, alkyl isoquinolinium bromide and an odor-masking agent selected from the group consisting of 3,5,5-trimethylhexanal, oxygenated monoterpenes such as citral, α- and β-ionone, natural citrus oils, and mixtures thereof.

The present invention also relates to highly concentrated cleaning compositions containing elevated levels of disinfectants such as a bactericide as disclosed herein. Such compositions can be made by combining a nonionic sugar surfactant such as alkyl glucose ester, aldobionamide, gluconamide, glyceramide, glyceroglycolipid and a polyhydroxy fatty acid amide surfactant, and an alkyl polyglycoside and either or both of: (a) an anionic surfactant such as an alkyl ether sulfate, (b) a mixture of at least two different alkyl polyglycosides wherein each alkyl polyglycoside has a different average carbon chain length in the alkyl moiety. The incorporation of (a) and/or (b) above produces a composition which is more stable at high solids levels and permits the preparation of highly concentrated compositions according to the invention having relatively large amounts of disinfectant.

This invention also relates to a process for increasing the efficacy of an odor masking or odor repressing agent which comprises adding an effective amount of a nonionic sugar surfactant or a combination of an anionic surfactant and a sugar surfactant to a composition comprised of an anti-bacterial compound as set forth herein and an odor masking or odor repressing agent as set forth herein.

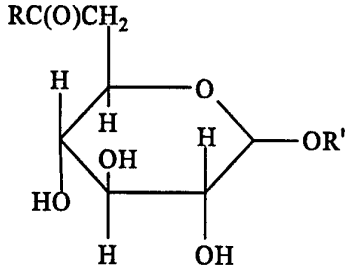
This invention also relates to a process for making an anti-bacterial cleaning composition which comprises adding a composition containing an effective amount of a nonionic sugar surfactant, an anti-bacterial compound as set forth herein and an odor masking or odor repressing agent as set forth herein to an aqueous composition containing one or more additional nonionic surfactants, anionic surfactants, amphoteric surfactants, and combinations thereof surfactants in addition to other compounds such as builders, hydrotropes, humectants, etc.

DESCRIPTION OF THE PREFERRED EMBODIMENTS

Other than in the claims and in the operating examples, or where otherwise indicated, all numbers expressing quantities of ingredients or reaction conditions used herein are to be understood as modified in all instances by the term "about".

The term nonionic sugar surfactant as used herein refers to surfactants that are based on saccharide moieties. Representative examples of such nonionic sugar surfactants include, but are not limited thereto, alkyl glucose ester, aldobionamide, gluconamide, glyceramide, glyceroglycolipid and polyhydroxy fatty acid amide surfactants, and alkyl polyglycosides each of which is described more fully hereinbelow.

The alkyl glucose ester sugar surfactants are generally disclosed in U.S. patent Nos. 5,109,127 and 5,190,747 the entire contents of both of which are incorporated herein by reference. These surfactants have the general formula I:

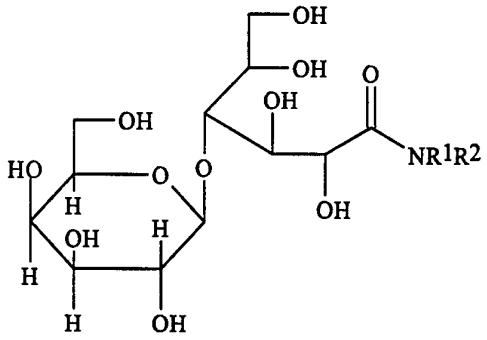


wherein R represents a fatty acid residue of 6 to 20 carbon atoms, preferably 6 to 12 carbon atoms and R^1 represents an alkyl group having 2 to 6 carbon atoms. Representative examples of such alkyl glucose esters are 1-ethyl-6-caprylglucoside, 1-ethyl-6-laurylglucoside, 1-butyl-6-caprylglucoside, 1-ethyl-6-palmitylglucoside and 1-ethyl-6-oleylglucoside.

The aldobionamide sugar surfactants are generally disclosed in U.S. Patent No. 5,310,542 and in published European Patent Application No. 550,281 both of which are incorporated herein by reference. An Aldobionamide is generally defined as the amide of an aldobionic acid or aldobionolactone and an aldobionic acid in turn is defined as a sugar substance (e.g. any cyclic sugar) in which the aldehyde group has been replaced by a carboxylic acid which upon

drying is capable of cyclizing to form an aldonolactone. The aldobionamides can be based on compounds comprising two saccharide units, e.g. lactobionamides, maltobionamides, cellobionamides, melibionamides, or gentiobionamides, or they can be based on compounds comprising more than two saccharide units provided that the polysaccharide has a terminal sugar unit with an aldehyde group available.

The preferred aldobionamides of the present invention are lactobionamides of the formula II



wherein R^1 and R^2 are the same or different and are selected from hydrogen and an aliphatic hydrocarbon radical containing up to about 36 carbon atoms (e.g. alkyl groups and alkenyl groups which groups may also include a heteroatom such as N, O, S, present, for instance, as an amide, carboxy, ether and/or saccharide moiety) except that R^1 and R^2 cannot simultaneously be hydrogen. The aliphatic hydrocarbon radical preferably contains up to 24 carbon atoms, most preferably from 8 to 18 carbon atoms. Representative examples of such lactobionamides are N-propyl lactobionamide, N-pentyl lactobionamide, N-decyl lactobionamide, N-hexadecyl lactobionamide, N-oleyl lactobionamide, N-dodecyl-N-methyl lactobionamide, and N-dodecyloxypropyl lactobionamide.

The gluconamide sugar surfactants are generally disclosed in U.S. Patent 5,352,386 the entire contents of which is incorporated herein by reference. These have the general formula III:

$HOCH_2-(CHOH)_m-C(O)-NHR$

wherein m is an integer from 2 to 5; and R is a straight or branched, saturated or unsaturated aliphatic hydrocarbon having 4 to about 24 carbon atoms, preferably 8 to 24 carbon atoms, which R group can also contain a heteroatom selected from the group consisting of oxygen, nitrogen and sulfur. Representative examples of such are N-octylerythronamide, N-decylerythronamide, N-dodecylerythronamide, N-tetradecylerythronamide, N-decylxylonamide and N-dodecylxylonamide.

The glyceramide sugar surfactants are generally disclosed in U.S. Patent 5,352,387, the entire contents of which are incorporated herein by reference. These surfactants have the general formula:

$HOCH_2CH(OH)C(O)NHR$

wherein R is a C_8 to C_{24} straight or branched chained, saturated or unsaturated aliphatic hydrocarbon in which the R group may also be substituted by a heteroatom selected from oxygen, nitrogen and sulfur. Representative examples of such surfactants are N-octylglyceramide, N-decylglyceramide and N-hexadecylglyceramide.

The glyceroglycolipid sugar surfactants are generally disclosed in U.S. Patent 5,358,656, and published European Patent Application No. 550,279, the disclosure of each of which is incorporated herein by reference. The glyceroglycolipids can be of the formula IV:

$A^1-O-CH_2-CH(B)-CH_2NRR_1$

wherein A^1 is a saccharide, preferably having one or more saccharide units, more preferably a mono or disaccharide and most preferably a monosaccharide such as glucose or galactose; R and R_1 are the same or different and are hydrogen, a branched or unbranched hydrocarbon radical having from 1 to about 24, preferably from about 6 to about 18 carbon atoms; B is OH or a NR^2R^3 group,

wherein R^2 and R^3 may be the same or different and are hydrogen, a branched or unbranched hydrocarbon radical having 1 to 24, preferably from 6 to 18 carbon atoms, and NRR_1 and B are positionally interchangeable. Representative examples of such surfactants are 3-(butylamino)-2-hydroxypropyl-β-D-galactopyranoside, 3-(octylamino)-2-hydroxypropyl-β-D-galactopyranoside, 3-(eicosylamino)-2-hydroxypropyl-β-D-galactopyranoside, 3-(butylamino)-2-hydroxypropyl-β-D-glucopyranoside, and 3-(pentylamino)-2-hydroxypropyl-β-D-mannopyranoside.

Other glyceroglycolipid surfactants are disclosed in published European Patent Application No. 550,280 which is incorporated herein by reference. These surfactants are of the formula:

$$A^1\text{-}O\text{-}CH_2\text{-}CH(OR_1)\text{-}CH_2OR$$

wherein A^1 is from 1 to 4 saccharide units and more preferably represents a mono or disaccharide, and most preferably a monosaccharide, for example, glucose or galactose; R and R_1 are the same or different and are hydrogen, or a branched or unbranched, saturated or unsaturated, hydrocarbon radical having from 1 to 24 carbon atoms, preferably from 6 to 18 carbon atoms. Representative examples of such surfactants are 3-(butyloxy)-2-hydroxypropyl-β-D-galactopyranoside, 3-(eicosyloxy)-2-hydroxypropyl-β-D-galactopyranoside, 3-(decyloxy)-2-hydroxypropyl-β-D-galactopyranoside, 3-(butyloxy)-2-hydroxypropyl-β-D-glucopyranoside, 3-(octyloxy)-2-hydroxypropyl-β-D-mannopyranoside, 3-(tetradecyloxy)-2-hydroxypropyl-β-D-lactoside, 3-(octadecyloxy)-2-hydroxypropyl-β-D-maltoside, 3-(octyloxy)-2-hydroxypropyl-β-D-galactotrioside, and 3-(dodecyloxy)-2-hydroxypropyl-β-D-cellotrioside.

The polyhydroxy fatty acid amide sugar surfactants are generally disclosed in U.S. Patent Nos. 5,174,927, 5,223,179 and 5,332,528 the entire disclosure of each of which is incorporated herein by reference. The polyhydroxy fatty acid amide surfactant component of the present invention comprises compounds of the structural formula V:

$R^2C(O)N(R^1)Z$

wherein: R^1 is H, C_1-C_4 hydrocarbyl, 2-hydroxy ethyl, 2-hydroxy propyl or a mixture thereof, preferably C_1-C_4 alkyl, more preferably C_1 or C_2 alkyl, most preferably C_1 alkyl (i.e., methyl); and R^2 is a C_5-C_{31} hydrocarbyl, preferably straight chain C_7-C_{19} alkyl or alkenyl, more preferably straight chain C_9-C_{17} alkyl or alkenyl, most preferably straight chain C_{11}-C_{17} alkyl or alkenyl, or mixture thereof; and Z is a polyhydroxyhydrocarbyl having a linear hydrocarbyl chain with at least 3 hydroxyls directly connected to the chain, or an alkoxylated derivative (preferably ethoxylated or propoxylated) thereof. Z preferably will be derived from a reducing sugar in a reductive amination reaction; more preferably Z is a glycityl. Suitable reducing sugars include glucose, fructose, maltose, lactose, galactose, mannose, and xylose. As raw materials, high dextrose corn syrup, high fructose corn syrup, and high maltose corn syrup can be utilized as well as the individual sugars listed above. These corn syrups may yield a mix of sugar components for Z. It should be understood that it is by no means intended to exclude other suitable raw materials. Z preferably will be selected from the group consisting of $-CH_2-(CHOH)n-CH_2OH$, $-CH(CH_2OH)-(CHOH)_{n-1}-CH_2OH$, $-CH_2-(CHOH)_2(CHOR')(CHOH)-CH_2OH$, where n is an integer from 3 to 5, inclusive, and R' is H or a cyclic or aliphatic monosaccharide, and alkoxylated derivatives thereof. Most preferred are glycityls wherein n is 4, particularly $-CH_2-(CHOH)_4-CH_2OH$.

In the above Formula R^1 can be, for example, N-methyl, N-ethyl, N-propyl, N-isopropyl, N-butyl, N-2-hydroxy ethyl, or N-2-hydroxy propyl. $R^2C(O)N<$ can be, for example, cocamide, stearamide, oleamide, lauramide, myristamide, capricamide, palmitamide, tallowamide, etc.

Z can be 1-deoxyglucityl, 2-deoxyfructityl, 1-deoxymaltityl, 1-deoxylactityl, 1-deoxygalactityl, 1-deoxymannityl, 1-deoxymaltotriotityl, etc. Representative examples of such cosurfactants are N-methyl-N-1-deoxyglucityl cocoamide and N-methyl-N-1-deoxyglucityl tallowamide.

Other suitable polyhydroxy fatty acid amide surfactants (see U.S. Patent Nos. 5,223,179 and 5,338,491, the entire contents of each which are incorporated herein by reference) are those of the formula VI:

$$RC(O)N(R^1)CH_2CH(OH)CH_2OH$$

wherein R is a C_7-C_{21} hydrocarbyl species, i.e. coconut, tallow, palm fatty alkyl and oleyl, and R^1 is a C_1 to C_6 hydrocarbyl or substituted hydrocarbyl species, i.e. N-alkyl-N-(1,2-propanediol) and N-hydroxyalkyl-N-1,2-propane diol fatty acid amides. Representative examples of such cosurfactants are the tallow amide of 3-[2-(hydroxyethyl)amino]-1,2-propanediol (HEAPD), the palmitate amide of 3-methylamino-1,2-propanediol (MAPD) and the lauramide of MAPD.

The alkyl polyglycoside surfactants are compounds of the formula VII

$$R_1O(R_2O)_b(Z)_a \qquad VII$$

wherein R_1 is a monovalent organic radical having from about 6 to about 30 carbon atoms; R_2 is divalent 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; a is a number having a value from 1 to about 6. Preferred alkyl polyglycosides which can be used in the compositions according to the invention have the formula VII wherein Z is a glucose residue and b is zero. Such alkyl polyglycosides are commercially available, for example, as APG®, GLUCOPON®, or PLANTAREN®, surfactants from Henkel Corporation, Ambler, PA., 19002. Examples of such surfactants include but are not limited to:

1. GLUCOPON® 225 Surfactant - an alkyl polyglycoside in which the alkyl group contains 8 to 10 carbon atoms and having an average degree of polymerization of 1.7.

2. GLUCOPON® 425 Surfactant - an alkyl polyglycoside in which the alkyl group contains 8 to 16 carbon atoms and having an average degree of polymerization of 1.55.

3. GLUCOPON® 625 Surfactant - an alkyl polyglycoside in which the alkyl group contains 12 to 16 carbon atoms and having an average degree of polymerization of 1.6.

4. APG® 325 Surfactant - an alkyl polyglycoside in which the alkyl group contains 9 to 11 carbon atoms and having an average degree of polymerization of 1.6.

5. GLUCOPON® 600 Surfactant - an alkyl polyglycoside in which the alkyl group contains 12 to 16 carbon atoms and having an average degree of polymerization of 1.4.

6. PLANTAREN® 2000 Surfactant - a C_{8-16} alkyl polyglycoside in which the alkyl group contains 8 to 16 carbon atoms and having an average degree of polymerization of 1.4.

7. PLANTAREN® 1300 Surfactant - a C_{12-16} alkyl polyglycoside in which the alkyl group contains 12 to 16 carbon atoms and having an average degree of polymerization of 1.6.

Other examples include alkyl polyglycoside surfactant compositions which are comprised of mixtures of compounds of formula VII wherein Z represents a moiety derived from a reducing saccharide containing 5 or 6 carbon atoms; a is a number having a value from 1 to about 6; b is zero; and R_1 is an alkyl radical having from 8 to 20 carbon atoms. The compositions are characterized in that they have increased surfactant properties and an HLB in the range of about 10 to about 16 and a non-Flory distribution of glycosides, which is comprised of a mixture of an alkyl monoglycoside and a mixture of alkyl polyglycosides having varying degrees of polymerization of 2 and higher in progressively decreasing amounts, in which the amount by weight of polyglycoside having a degree of polymerization of 2, or mixtures thereof with the polyglycoside having a degree of polymerization of 3, predominate in relation to the amount of monoglycoside, said composition having an average degree of polymerization of about 1.8 to about 3. Such compositions, also known as peaked alkyl polyglycosides, can be prepared by separation of the monoglycoside from the original reaction mixture of alkyl monoglycoside and alkyl polyglycosides after removal of the alcohol. This separation may be carried out by molecular distillation and normally results in the removal of about 70-95% by weight of the alkyl monoglycosides. After removal of the alkyl monoglycosides, the relative distribution of the various components, mono- and poly-glycosides, in the resulting product changes and the

concentration in the product of the polyglycosides relative to the monoglycoside increases as well as the concentration of individual polyglycosides to the total, i.e. DP2 and DP3 fractions in relation to the sum of all DP fractions. Such compositions are disclosed in U.S. patent 5,266,690, the entire contents of which are incorporated herein by reference.

Other alkyl polyglycosides which can be used in the compositions according to the invention are those in which the alkyl moiety contains from 6 to 18 carbon atoms in which and the average carbon chain length of the composition is from about 9 to about 14 comprising a mixture of two or more of at least binary components of alkyl polyglycosides, wherein each binary component is present in the mixture in relation to its average carbon chain length in an amount effective to provide the surfactant composition with the average carbon chain length of about 9 to about 14 and wherein at least one, or both binary components, comprise a Flory distribution of polyglycosides derived from an acid-catalyzed reaction of an alcohol containing 6-20 carbon atoms and a suitable saccharide from which excess alcohol has been separated.

Preferred nonionic sugar surfactants are alkyl polyglycosides as set forth above.

The mixtures of alkyl polyglycosides which are useful for making highly concentrated cleaning compositions containing elevated levels of disinfectants such as a bactericide are combinations of alkyl polyglycosides wherein each of the alkyl moieties contains from 8 to 16 carbon atoms on the average. Thus, for example, a mixture containing an alkyl polyglycoside having an average carbon chain length of 8 carbons in the alkyl moiety and an alkyl polyglycoside having an average carbon chain length of 16 carbons in the alkyl moiety can be used to make highly concentrated cleaning compositions containing elevated levels of disinfectants such as a bactericide. The preferred mixture of alkyl polyglycosides contains a C_{10} and a C_{12} alkyl polyglycoside. The relative amount of each alkyl polyglycoside will depend upon a number of variables such as the nature of the alkyl polyglycosides, the type of antibacterial compound, the presence of other surfactants and the nature of the odor-masking agent. The relative amount of

each alkyl polyglycoside by weight can range from 30/70 to about 70/30 with the preferred being from 40/60 to about 60/40.

An effective amount of sugar surfactant according to the invention is any amount sufficient to decrease the amount of odor masking or odor repressing agent relative to the amount of odor masking or odor repressing agent that would be required without the use of a sugar surfactant. This amount can be readily determined by one of ordinary skill in the art and will typically vary from a sugar surfactant /odor masking agent weight ratio of from about 2/1 to about 45/1. The preferred sugar surfactant is alkyl polyglycoside.

The term anti-bacterial agent as used herein includes compounds which are bacteriocidal and bacteriostatic.

The compositions and processes according to the invention are particularly effective when the anti-bacterial compound is a halo-substituted monohydric phenol, a halo-substituted dihydric phenol, a halo-substituted trihydric phenol compound, halo-substituted hydroxybenzoic acid, and a halo-substituted bis(hydroxyphenyl)alkane.

By "halo-substituted" it is meant that the compound has one or more halogen atoms, preferably chlorine or bromine, covalently bonded to the phenolic ring. The compounds may also have other substituents, e.g. alkyl groups, aralkyl groups, alkaryl groups, alkoxy groups, aryloxy groups, alkaryloxy groups, and aralkoxy groups. The terms dihydric phenol and trihydric phenol are meant to include both compounds wherein the hydroxyl groups of the compound are all on one phenyl group (e.g. a resorcinol derivative) and compounds wherein two or more hydroxyl groups are distributed among two or more phenyl groups in the compound (e.g. a hydroxyphenyl phenol derivative). The compounds can be in the free hydroxyl form or a salt thereof, e.g. sodium, calcium, or ammonium.

Examples of suitable phenolic compounds include but are not limited to halo-phenols, preferably ortho- or para-substituted (e.g. o-chlorophenol, p-chlorophenol, o-bromophenol, and p-bromophenol), alkyl-halo-phenols, for preferably C_1 to C_7 normal alkyl-substituted halo-phenols (e.g. 2-chloro-4-methyl-phenol, 4-chloro-2-methyl-phenol, 2-bromo-4-methyl-phenol, 4-bromo-2-methyl-phenol, 2-chloro-4-(n-heptyl)-phenol 4-chloro-3,5-dimethyl-phenol, and 4-chloro-

3,5-di(n-heptyl)-phenol), aralkyl-halo-phenols, preferably benzyl-halo-phenols (e.g. p-chloro-o-benzyl-phenol), aryl-halo-phenols, preferably phenyl-halo-phenols (e.g. p-chloro-o-phenyl-phenol), dihydric phenols, preferably hydroxy-halo-phenyloxy-halo-phenols (e.g. 2,4,4'-trichloro-2'-hydroxydiphenyl ether) and bis(hydroxy-halo-phenyl)alkanes, preferably bis(hydroxy-halo-phenyl)methanes (e.g. 2,2'-methylenebis(4-chlorophenol) and 2,2'-methylenebis(3,4,6-trichlorophenol). The process according to the invention is most effective when the anti-bacterial compound is 4-chloro-3,5-dimethyl-phenol (also known as p-chloro-meta-xylenol, "PCMX").

The process according to the invention is also particularly effective when the anti-bacterial compound is one or more quaternary ammonium bromide compounds selected from the group consisting of lauryl dimethylbenzyl ammonium bromide, commercially available as, for example, AMOMYL® BR 1244 a trademark product of Seppic; alkyl trimethyl ammonium bromide, commercially available as, for example, EMPIGEN® CHB 40, a trademark product of Albright & Wilson; alkyl isoquinolinium bromide, commercially available as, for example, CATINAL® CB 50, a trademark product of Toho Chemical.

The amount of anti-bacterial compound which can be used in cleaning compositions is any disinfecting amount or anti-bacterially effective amount and will depend upon the concentration or the use dilution. The amount will typically vary from 0.1% to 5% by weight.

The anionic surfactants that can be used in combination with the sugar surfactants to produce disinfectant cleaning compositions which are more stable at elevated total solids levels are selected from the group consisting of alkyl sulfates, alkyl ether sulfates, alkyl sulfonates, alkyl ether sulfonates, and sulfosuccinates. The preferred type of anionic surfactant is an alkyl ether sulfate. The amount of such anionic surfactant is any amount which will produce a stable composition that will not separate or become otherwise unstable upon prolonged standing. The amount of anionic surfactant can be readily determined by one of ordinary skill in the art and will typically vary from an anionic surfactant/antibacterial compound weight from about 8/1 to about 17/1 with the

preferred amount being from about 1/1 to about 3/1.

The process according to the invention can be employed for any type of odor masking or odor repressing agent such as those described in an article entitled "Odor Modification" in Encyclopedia of Chemical Technology, vol. 16, pp. 303-304 (Kirk-Othmer, eds., John Wiley & Sons, Inc. N.Y., N.Y., 3d ed. 1981). These compounds include 3,5,5-trimethylhexanal, oxygenated monoterpenes such as citral, α- and β-ionone, natural citrus oils, and mixtures thereof. Preferred odor masking or odor repressing agents include Mask #39741 and Fragrance 49627, which are combinations of aromatic aldehydes, esters, alcohols, and oxygenated monoterpenes such as ionones, available from Flavor and Fragrance Specialties, Franklin Lakes, NJ.

One preferred embodiment of the present invention is a composition containing an effective amount of an alkyl polyglycoside surfactant of the formula VII

$$R_1O(R_2O)_b(Z)_a \qquad VII$$

wherein R_1 is a monovalent organic radical having from about 6 to about 30 carbon atoms; R_2 is divalent 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; a is a number having a value from 1 to about 6 is added to a composition comprised of an effective amount of 4-chloro-3,5-dimethyl-phenol (p-chloro-meta-xylenol) and an effective amount of Mask #39741. A preferred alkyl polyglycoside is one in which the alkyl group contains 8 to 16 carbon atoms and having an average degree of polymerization of 1.55.

The following examples are meant to illustrate but not to limit the invention.

EXAMPLE 1

A Concentrated Disinfectant Composition Containing Anionic Surfactant

The following disinfectant cleaning composition was a clear fluid product:

17.9 grams of GLUCOPON® 600 Surfactant (50%)
53.8 g of $C_{12}H_{25}(EO)_3SO_4Na$ (50%)
20 g of 4-chloro-3,5-dimethyl-phenol (PCMX)
6.7 g of Mask #39741
1.6 g of ethanol

EXAMPLE 2
A Concentrated Disinfectant Composition Containing A Mixture of Alkyl Polyglycosides

A clear, flowable, readily dilutable concentrate contained the following ingredients:

Ingredient	Wt. %
PLANTAREN® 2000	37.42
GLUCOPON® 625	37.42
Propylene glycol	13.00
PCMX	10.00
Fragrance 49627	1.67

The first three ingredients were heated together with mixing to 70°C. The PCMX was then slowly mixed in while heating at 75-80°C. The mixture was cooled to room temperature and the Fragrance 49627 was added. The pH was adjusted to 7.0 with a 50% citric acid solution.

A similar formulation containing either 74.8 % of PLANTAREN® 2000 or 74.8% of GLUCOPON® 625 did not form a clear uniform product.

What is claimed is:

1. A disinfectant cleaning composition comprising: (a) an amount of a nonionic sugar surfactant sufficient to decrease the effective amount of an odor masking agent wherein said nonionic sugar surfactant is selected from the group consisting of an alkyl glucose ester, an aldobionamide, a gluconamide, a glyceramide, a glyceroglycolipid, a polyhydroxy fatty acid amide, an alkyl polyglycoside, and combinations thereof: (b) a disinfecting effective amount of an anti-bacterial compound selected from the group consisting of a halo-substituted monohydric phenol, a halo-substituted dihydric phenol, a halo-substituted trihydric phenol, a halo-substituted hydroxybenzoic acid, a halo-substituted bis(hydroxyphenyl)alkane, lauryl dimethylbenzyl ammonium bromide, alkyl trimethyl ammonium bromide, and an alkyl isoquinolinium bromide; (c) an odor masking effective amount of an odor-modifying agent selected from the group consisting of 3,5,5-trimethylhexanal, aromatic aldehydes, esters, alcohols, and oxygenated monoterpenes, citral, α- and β-ionone, natural citrus oils, and mixtures thereof.

2. The composition of claim 1 wherein said anti-bacterial compound is 4-chloro-3,5-dimethylphenol.

3. The composition of claim 1 wherein said anti-bacterial compound is lauryl benzyl dimethylammonium chloride.

4. The composition of claim 1 wherein said sugar surfactant is an alkyl polyglycoside of the formula VII

$$R_1O(R_2O)_b(Z)_a \qquad \text{VII}$$

wherein R_1 is a monovalent organic radical having from about 6 to about 30 carbon atoms; Z is a saccharide residue having 6 carbon atoms; b is 0; a is a number having a value from 1 to about 6.

5. The composition of claim 4 wherein R_1 is a monovalent organic radical having from about 12 to about 16 carbon atoms and a is a number having a value from 1 to about 2.0.

6. The composition of claim 4 wherein said odor masking agent is a mixture of aromatic aldehydes, esters, alcohols, and oxygenated monoterpenes.

7. The composition of claim 4 wherein the weight ratio of alkyl polyglycoside/odor masking agent is from about 45/1 to about 2/1.

8. A disinfectant cleaning composition comprising: (a) an solubilizing amount of a mixture comprised of a first and a second alkyl polyglycoside wherein each of said first and second alkyl polyglycosides has a different average carbon chain length in the alkyl moiety; (b) a disinfecting effective amount of an anti-bacterial compound selected from the group consisting of a halo-substituted monohydric phenol, a halo-substituted dihydric phenol, a halo-substituted trihydric phenol, a halo-substituted hydroxybenzoic acid, a halo-substituted bis(hydroxyphenyl)alkane, lauryl dimethylbenzyl ammonium bromide, alkyl trimethyl ammonium bromide, and an alkyl isoquinolinium bromide; (c) an odor masking effective amount of an odor-modifying agent selected from the group consisting of 3,5,5-trimethylhexanal, aromatic aldehydes, esters, alcohols, and oxygenated monoterpenes, citral, α- and β-ionone, natural citrus oils, and mixtures thereof.

9. The composition of claim 8 wherein (a) is a mixture of a C_8 and a C_{16} alkyl polyglycoside.

10. The composition of claim 9 wherein the weight ratio of said C_8 to said C_{16} alkyl polyglycoside is from about 30/70 to about 70/30.

11. The composition of claim 10 wherein the weight ratio of said C_8 to said C_{16} alkyl polyglycoside is from about 40/60 to about 60/40.

12. The composition of claim 8 wherein said anti-bacterial compound is 4-chloro-3,5-dimethylphenol.

13. The composition of claim 8 wherein said anti-bacterial compound is lauryl benzyl dimethylammonium chloride.

14. A disinfectant cleaning composition comprising: (a) an amount of a nonionic sugar surfactant sufficient to decrease the effective amount of an odor masking agent wherein said nonionic sugar surfactant is selected from the group consisting of an alkyl glucose ester, an aldobionamide, a gluconamide, a glyceramide, a glyceroglycolipid, a polyhydroxy fatty acid amide, an alkyl polyglycoside, and combinations thereof: (b) a disinfecting effective amount of an anti-bacterial compound selected from the group consisting of a halo-substituted monohydric phenol, a halo-substituted dihydric phenol, a halo-substituted trihydric phenol, a halo-substituted hydroxybenzoic acid, a halo-substituted bis(hydroxyphenyl)alkane, lauryl dimethylbenzyl ammonium bromide, alkyl trimethyl ammonium bromide, and an alkyl isoquinolinium bromide; (c) an odor masking effective amount of an odor-modifying agent selected from the group consisting of 3,5,5-trimethylhexanal, aromatic aldehydes, esters, alcohols, and oxygenated monoterpenes, citral, α- and β-ionone, natural citrus oils, and mixtures thereof; (d) an anionic surfactant selected from the group consisting of an alkyl sulfate, an alkyl ether sulfate, an alkyl sulfonate, an alkyl ether sulfonate, a sulfosuccinate and mixtures thereof.

15. The composition of claim 14 wherein said anionic surfactant is an alkyl ether sulfate.

16. The composition of claim 14 wherein said anti-bacterial compound is 4-chloro-3,5-dimethylphenol.

17. The composition of claim 14 wherein said anti-bacterial compound is lauryl benzyl dimethylammonium chloride.

18. The composition of claim 14 wherein said sugar surfactant is an alkyl polyglycoside of the formula VII

$$R_1O(R_2O)_b(Z)_a \qquad VII$$

wherein R_1 is a monovalent organic radical having from about 6 to about 30 carbon atoms; Z is a saccharide residue having 6 carbon atoms; b is 0; a is a number having a value from 1 to about 6.

19. The composition of claim 18 wherein R_1 is a monovalent organic radical having from about 12 to about 16 carbon atoms and a is a number having a value from 1 to about 2.0.

20. The composition of claim 14 wherein said odor masking agent is a mixture of aromatic aldehydes, esters, alcohols, and oxygenated monoterpenes.

21. The composition of claim 14 wherein the weight ratio of anionic surfactant/antibacterial compound is from about 8/1 to about 17/1.

22. The composition of claim 21 wherein said ratio is from about 1/1 to about 3/1.

23. A process for increasing the efficacy of an odor masking or odor repressing agent which comprises mixing (a) an amount of a nonionic sugar surfactant sufficient to decrease the effective amount of an odor masking agent wherein said nonionic sugar surfactant is selected from the group consisting of an alkyl glucose ester, an aldobionamide, a gluconamide, a glyceramide, a glyceroglycolipid, a polyhydroxy fatty acid amide, an alkyl polyglycoside, and combinations thereof: (b) a disinfecting effective amount of an anti-bacterial compound selected from the group consisting of a halo-substituted monohydric phenol, a halo-substituted dihydric phenol, a halo-substituted trihydric phenol, a halo-substituted hydroxybenzoic acid, a halo-substituted bis(hydroxyphenyl)alkane, lauryl dimethylbenzyl ammonium bromide, alkyl trimethyl ammonium bromide, and an alkyl isoquinolinium bromide; (c) an odor

masking effective amount of an odor-modifying agent selected from the group consisting of 3,5,5-trimethylhexanal, aromatic aldehydes, esters, alcohols, and oxygenated monoterpenes, citral, α- and β-ionone, natural citrus oils, and mixtures thereof.

24. The process of claim 23 wherein said anti-bacterial compound is 4-chloro-3,5-dimethylphenol.

25. The process of claim 23 wherein said anti-bacterial compound is lauryl benzyl dimethylammonium chloride.

26. The process of claim 23 wherein said sugar surfactant is an alkyl polyglycoside of the formula VII

$$R_1O(R_2O)_b(Z)_a \qquad VII$$

wherein R_1 is a monovalent organic radical having from about 6 to about 30 carbon atoms; Z is a saccharide residue having 6 carbon atoms; b is 0; a is a number having a value from 1 to about 6.

27. The composition of claim 26 herein R_1 is a monovalent organic radical having from about 12 to about 16 carbon atoms and a is a number having a value from 1 to about 2.0.

28. The process of claim 23 wherein said odor masking agent is a mixture of aromatic aldehydes, esters, alcohols, and oxygenated monoterpenes.

29. The process of claim 23 wherein the weight ratio of alkyl polyglycoside/odor masking agent is from about 45/1 to about 2/1.

30. A process for making a disinfectant cleaning composition having an elevated amount of a disinfectant comprising mixing (a) a solubilizing amount of a mixture comprised of a first and a second alkyl polyglycoside wherein each of said first and second alkyl polyglycosides has a different average carbon chain

length in the alkyl moiety or an anionic surfactant selected from the group consisting of an alkyl sulfate, an alkyl ether sulfate, an alkyl sulfonate, an alkyl ether sulfonate, a sulfosuccinate or mixtures thereof with (b) an amount of a nonionic sugar surfactant sufficient to decrease the effective amount of an odor masking agent wherein said nonionic sugar surfactant is selected from the group consisting of an alkyl glucose ester, an aldobionamide, a gluconamide, a glyceramide, a glyceroglycolipid, a polyhydroxy fatty acid amide, an alkyl polyglycoside, and combinations thereof; (c) a disinfecting effective amount of an anti-bacterial compound selected from the group consisting of a halo-substituted monohydric phenol, a halo-substituted dihydric phenol, a halo-substituted trihydric phenol, a halo-substituted hydroxybenzoic acid, a halo-substituted bis(hydroxyphenyl)alkane, lauryl dimethylbenzyl ammonium bromide, alkyl trimethyl ammonium bromide, and an alkyl isoquinolinium bromide; (d) an odor masking effective amount of an odor-modifying agent selected from the group consisting of 3,5,5-trimethylhexanal, aromatic aldehydes, esters, alcohols, and oxygenated monoterpenes, citral, α- and β-ionone, natural citrus oils, and mixtures thereof.

31. The process of claim 30 wherein said anti-bacterial compound is 4-chloro-3,5-dimethylphenol.

32. The process of claim 30 wherein said anti-bacterial compound is lauryl benzyl dimethylammonium chloride.

33. The process of claim 30 wherein said first and second alkyl polyglycosides are C_8 and a C_{16} alkyl polyglycoside.

34. The process of claim 33 wherein the weight ratio of said C_8 to said C_{16} alkyl polyglycoside is from about 30/70 to about 70/30.

35. The process of claim 34 wherein the weight ratio of said C_8 to said C_{16} alkyl polyglycoside is from about 40/60 to about 60/40.

INTERNATIONAL SEARCH REPORT

International application No.
PCT/US96/09244

A. CLASSIFICATION OF SUBJECT MATTER

IPC(6) :A01N 25/30, 25/32; C11D 3/22, 3/32, 3/48, 3/50, 11/00.
US CL :422/37; 510/101-107, 319, 384, 386, 388, 391, 463, 470, 501, 502.
According to International Patent Classification (IPC) or to both national classification and IPC

B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)

U.S. : 422/37; 510/101-107, 319, 384, 386, 388, 391, 463, 470, 501, 502.

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

Electronic data base consulted during the international search (name of data base and, where practicable, search terms used)

Please See Extra Sheet.

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
Y	US, E, H269 (MALIK) 05 May 1987, see entire document in general, especially ll. 10 & 11 of abstract; col. 3, ll. 33, 35-36 & 37; col. 7, ll. 21, 25 & 26-28.	1-35
Y	US, A, 3,547,828 (MANSFIELD ET AL.) 15 December 1970, see Example 5 in col. 6.	8-11, 13, 30, 32-35
Y	US, A, 4,880,558 (JOST ET AL.) 14 November 1989, see col. 2, ll. 53-54; col. 3, ll. 27-50; col. 6, ll. 12-36, 51-54.	2, 12, 14-22, 24, 31
Y	US, A, 5,025,069 (DEGUCHI ET AL.) 18 June 1991, see last 6 ll. of abstract; col. 5, ll. 31-37; col. 5, l. 57 - col. 6, l. 14.	1-35

[X] Further documents are listed in the continuation of Box C. [ ] See patent family annex.

*	Special categories of cited documents:	"T"	later document published after the international filing date or priority date and not in conflict with the application but cited to understand the principle or theory underlying the invention
"A"	document defining the general state of the art which is not considered to be of particular relevance	"X"	document of particular relevance; the claimed invention cannot be considered novel or cannot be considered to involve an inventive step when the document is taken alone
"E"	earlier document published on or after the international filing date	"Y"	document of particular relevance; the claimed invention cannot be considered to involve an inventive step when the document is combined with one or more other such documents, such combination being obvious to a person skilled in the art
"L"	document which may throw doubts on priority claim(s) or which is cited to establish the publication date of another citation or other special reason (as specified)	"&"	document member of the same patent family
"O"	document referring to an oral disclosure, use, exhibition or other means		
"P"	document published prior to the international filing date but later than the priority date claimed		

Date of the actual completion of the international search 23 AUGUST 1996	Date of mailing of the international search report 29 NOV 1996
Name and mailing address of the ISA/US Commissioner of Patents and Trademarks Box PCT Washington, D.C. 20231 Facsimile No. (703) 305-3230	Authorized officer ARDITH HERTZOG Telephone No. (703) 308-0661

Form PCT/ISA/210 (second sheet)(July 1992)*

C (Continuation). DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
Y	US, A, 5,330,674 (URFER ET AL.) 19 July 1994, see entire document in general, especially Tables 1 & 2 in col. 4.	1-35
Y	US, A, 5,370,816 (BALZER ET AL.) 06 December 1994, see col. 1, l. 54 - col. 2, l. 8; col. 2, ll. 24-39; col. 8, ll. 1-11.	8-13, 30-35
Y	US, A, 5,403,505 (HACHMANN ET AL.) 04 April 1995, see abstract; col. 3, ll. 26-68; col. 4, ll. 18-32, 56-60; col. 5, ll. 30-35, especially l. 33.	1-13, 23-35

B. FIELDS SEARCHED
Electronic data bases consulted (Name of data base and where practicable terms used):

APS
search terms: disinfect?, dis, infect?, antimicrob?, anti, microb?, biocid?, sterili!?, apg, alkylpolygl!coside#, alkylgl!coside#, alkylpolysaccharide#, alkylsaccharide#, alkyl, poly, alkylpoly, polygl!coside#, gl!coside#, polysaccharide#, saccharide#