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(54) Title: ANTI-BACTERIAL CLEANING COMPOSITION

(57) Abstract: The present invention is directed to a multi-surface cleaning composition having an anti-bacterial ingredient for cleaning furniture surfaces. The anti-bacterial cleaning component includes a quaternary ammonium chloride compound or combinations thereof. The composition further includes a pH adjuster to provide for a generally neutral pH in the range of about 6 to about 9 including a combination of components, preferably white distilled vinegar and an amine compound. The cleaning composition provides for good cleaning and disinfecting of wood surfaces and other furniture surfaces without leaving streaks.

ANTI-BACTERIAL CLEANING COMPOSITION

RELATED APPLICATION

[0001] The present application claims benefit of U.S. Provisional Application Serial No. 61/344,238 filed June 17, 2010 entitled "ANTI-BACTERIAL CLEANING COMPOSITION".

FIELD OF INVENTION

[0002] This invention relates to anti-bacterial cleaning compositions for use on furniture surfaces. More particularly, the invention relates to anti-bacterial cleaning compositions for use on multiple types of furniture surfaces, including on wood surfaces and glass surfaces, and provides good cleaning and disinfecting results without streaking.

BACKGROUND OF INVENTION

[0003] Multi-surface anti-bacterial cleaning compositions are known in the art. However, most of these cleaning compositions have a harsh pH, either very high or very low, and therefore are not conducive to cleaning furniture, especially wood furniture.

[0004] Multi-surface anti-bacterial cleaning compositions generally are required to have low volatile organic compound ("VOC") content, e.g. less than 3%. The formulation of low VOC content multi-surface anti-bacterial cleaning compositions is rendered difficult as the composition must meet the low VOC content requirement and at the same time provide for the optimum cleaning and

disinfecting of the furniture surface, as well as not damage the surface being treated.

[0005] The present invention provides a new and useful anti-bacterial cleaning composition overcoming the problems of the prior art compositions.

SUMMARY OF INVENTION

According to a first aspect of the present invention, there is provided an anti-bacterial cleaning composition for application on furniture surfaces to clean and disinfect such surfaces without streaking comprising

(a) about 0.001 to about 0.25 wt.% of at least one quaternary ammonium compound;

(b) about 0.001 to about 2 wt.% of a pH adjustor comprising a combination of at least two organic or inorganic builders;

(c) about 0.001 to about 0.5 wt.% of at least one surfactant comprising at least one nonionic surfactant and, optionally, a cationic surfactant, and wherein the at least one surfactant excludes anionic and amphoteric surfactants;

(d) about 95 to about 99.8 wt.% of at least one water-soluble solvent or solubilizer comprising water and at least one compound which is an alcohol, an alkylene glycol, and a glycol ether, wherein water is the major constituent of the at least one solvent or solubilizer; and

(e) optionally, one or more adjuvants selected from fragrances and colorants;

wherein the composition has a pH of about 6 to about 9, and weight total of the composition is based on 100 wt.%.

According to a second aspect of the present invention, there is provided an anti-bacterial cleaning composition for application on furniture surfaces to clean and disinfect such surfaces without streaking comprising

(a) about 0.001 to 0.25 wt.% of at least one quaternary ammonium chloride compound;

(b) about 0.05 to about 1 wt.% white distilled vinegar;

(c) about 0.05 to about 1 wt.% alkanolamine;

(d) about 95 to about 99.8 wt.% of a water-soluble solvent or solubilizer comprising water, an alcohol, an alkylene glycol ether, and an alkylene glycol, wherein the water is the major constituent of the water-soluble solvent or solubilizer;

(e) about 0.001 to about 0.5 wt.% of at least one surfactant comprising at least one nonionic surfactant and, optionally, a cationic surfactant, and wherein the at least one surfactant excludes anionic and amphoteric surfactants; and

(f) optionally, one or more adjuvants selected from fragrances and colorants;

wherein the composition has a pH of about 6 to about 9, and weight total of the composition is based on 100 wt.%.

[0006] The anti-bacterial cleaning composition of the present invention is useful for cleaning different furniture surfaces including wood, wood laminates and combination of wood and glass furniture. Additionally, the composition is useful for cleaning other furniture surfaces including marble, granite and stainless steel. The cleaning composition provides for beneficial cleaning of furniture due to the use of an anti-bacterial compound and having an adjusted pH in the range of about 6 to 9, more preferably 7 to 9, and most preferably 8 to 9. The pH is adjusted by a combination of ingredients, including the use of white distilled vinegar and an amine. The adjusted pH renders the composition less harsh and allows for the safe and effective cleaning and disinfecting of furniture surfaces, especially wood and wood laminate surfaces.

[0007] The cleaning composition of the invention includes an anti-bacterial ingredient to provide for a generally microbial-free surface. The anti-bacterial ingredient useful in the invention is a quaternary ammonium chloride or combinations thereof.

[0008] The cleaning composition of the invention further provides for a low degree of foaming, thereby reducing streaking of the furniture and glass surfaces. The low

degree of foaming in the composition is achieved by, among other things, the use of a nonionic surfactant. Use of a nonionic surfactant without an anionic or amphoteric surfactant functions well with the quaternary ammonium chloride active cleaning ingredient.

[0009] The cleaning composition of the present invention is preferably used in an aerosol delivery system. However, the composition also may be delivered by a trigger spray container or impregnated into a wipe.

DETAILED DESCRIPTION OF THE INVENTION

[0010] The present invention is directed to a multi-surface cleaning composition having an anti-bacterial ingredient for cleaning furniture surfaces. The anti-bacterial cleaning component comprises a quaternary ammonium chloride compound. The composition further includes a pH adjuster to provide for a generally neutral pH in the range of about 6 to about 9, more preferably 7 to 9, and most preferably 8 to 9, comprising a combination of components, preferably white distilled vinegar and an amine compound. The cleaning composition provides for good cleaning and disinfecting of wood surfaces and other furniture surfaces, including entertainment centers having a combination of wood and glass surfaces. The cleaning composition does so without leaving streaks on the furniture surface.

[0011] The anti-bacterial/disinfectant cleaning component is a quaternary ammonium chloride. This component provides for the effective killing of microbial elements. The quaternary ammonium chloride component may

be one or a combination of quaternary ammonium chloride compounds. A preferred quaternary ammonium chloride is a combination of an alkyl dimethyl benzyl ammonium chloride and an alkyl dimethyl ethylbenzyl ammonium chloride. Presently preferred quaternary ammonium chlorides include BTC 2125M manufactured and sold by Stepan Company and BARQUAT 4280-Z manufactured and sold by Lonza, Inc. These are long chain (i.e., C_{12}-C_{18}) quaternary ammonium chlorides and combine well with the nonionic surfactant as discussed hereafter. The anti-bacterial agent may be present in the range (by weight %) of about 0.001 to about 0.25%. A more preferred range is about 0.005 to about 0.15%. The most preferred range is about 0.01 to about 0.1%.

[0012] The cleaning composition includes a pH adjuster to provide a pH in the range of about 6 to about 9. This pH range provides for the good cleaning of furniture, including wood surfaces, without damaging such surfaces which is not possible with the known anti-bacterial hard surface cleaning compositions which generally have a harsh pH, e.g. either in the range of around 3 on the acidic side or in the range of 10 to 11 on the alkaline side. The pH boosters useful in the composition are water-soluble organic and/or inorganic builders. Preferably, the pH boosters comprise white distilled vinegar, i.e. acetic acid (15% active) and an amine. The white distilled vinegar generally provides for a pH in the range of 5 to 6 when used with the additional components of the composition. The pH is further adjusted to the range of about 8 to about 9 with the use of an amine, preferably an alkanolamine, more preferably ethanolamine. The amine provides for

adjustment of the pH and also functions as a cleaning agent. The pH boosters may be present in the range (by weight %) of about 0.001 to about 2.0%. A preferred range is about 0.05 to about 1.0%. The most preferred range is about 0.2 to about 0.6%.

[0013] The composition further includes a nonionic and/or cationic surfactant which works well with the quaternary ammonium chloride. The preferred non-ionic surfactant is an alkoxylated linear alcohol. Preferred surfactants are secondary alcohol alkoxylates, in particular ethoxylates, such as Tergitol 15-S-9 manufactured and sold by The Dow Chemical Company which is a C_6-C_{17} secondary alcohol poly (3-6 EO) ethoxylate. Additional nonionic surfactants useful with the invention include alkanolamides, amine oxides, and ethoxylated fatty esters. These nonionic surfactants have a low level of foaming when combined with the other ingredients of the composition providing for good cleaning, removal of microbial elements and avoidance of streaking of the furniture surface. The surfactant may be present in the range (by weight %) of about 0.001 to about 0.5%. The preferred range is about 0.01 to about 0.2%. The most preferred range is about 0.04 to about 0.12%.

[0014] The cleaning composition does not use amphoteric or anionic surfactants. These surfactants will bind with the quaternary ammonium chloride, thereby reducing the effectiveness of the anti-bacterial agent due to decreasing the level of actives available. Additionally, such surfactants may increase the level of foaming which is not desirable.

[0015] The cleaning composition of the invention further includes water-soluble solvents and/or solublizers which include water, glycols, glycol ethers and alcohols. The preferred solvents include short carbon chain alkylene glycols, alkylene glycol ethers and alkanols; and most preferably ethylene glycol n-hexyl ether, propylene glycol and isopropanol. The solvents and/or solublizer are present in the range (by weight %) of about 95.0 to about 99.8%. The preferred range is about 97.5 to about 99.8%. The most preferred range is about 98.5 to about 99.8%.

[0016] A fragrance is preferably included in the composition. A presently preferred fragrance is a citrus fragrance which conveys freshness and cleanliness to the user. The fragrance is present in the range (by weight %) of about 0.001 to about 1.0%. The preferred range is about 0.01 to about 0.8%. The most preferred range is about 0.05 to about 0.4%.

[0017] The preferred delivery system for the cleaning composition of the invention is an aerosol delivery system. The aerosol delivery system preferred is compressed gas, and more preferably compressed air or nitrogen. However, a hydrocarbon gas aerosol is also suitable for use. The cleaning composition of the invention may also use a trigger (non-aerosol) delivery system or be impregnated in a wipe.

[0018] In one presently preferred embodiment of the invention, a useful anti-bacterial cleaning composition for cleaning furniture comprises:

Ingredient	Wt.%
Water (Diluent)	96.614
Isopropanol (Solvent)	1.5
Compressed Air or Nitrogen (Propellant)	0.8
Ethylene Glycol n-Hexyl Ether (Solvent) (aka Hexyl Cellosolve)	0.3
White Distilled Vinegar (aka acetic acid, 15% active)(pH booster)	0.3
Fragrance Mixture	0.15
Propylene Glycol (Solvent)	0.13
Ethanolamine (pH Adjuster and Cleaning Agent)	0.1
TERGITOL 15-S-9 (Nonionic Surfactant) (Ethoxylated Linear Alcohol) (Secondary Alcohol Ethoxylate) (Alcohol C_6-C_{17} (Secondary)poly(3-6)ethoxylate)	0.075
BTC 2125M (80% Actives); (Disinfectant) (n-alkyl dimethylbenzyl ammonium chloride/ n-alkyl dimethyl ethylbenzyl ammonium chloride)	0.031
OR	
BARQUAT 4280-Z (80% Actives); (Disinfectant) (n-alkyl dimethylbenzyl ammonium chloride/ n-alkyl dimethyl ethylbenzyl ammonium chloride)	
	100%

pH = 8.5

[0019] While the above composition is a presently preferred embodiment of the invention, it is understood that different ranges of ingredients may be used, as well as different combinations of base ingredients or equivalents of base ingredients, including as set forth herein.

[0020] As will be apparent to one skilled in the art, various modifications can be made within the scope of the aforesaid description. Such modifications being within the ability of one skilled in the art form part of the present invention.

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CLAIMS

1. Anti-bacterial cleaning composition for application on furniture surfaces to clean and disinfect such surfaces without streaking comprising

(a) about 0.001 to about 0.25 wt.% of at least one quaternary ammonium compound;

(b) about 0.001 to about 2 wt.% of a pH adjustor comprising a combination of at least two organic or inorganic builders;

(c) about 0.001 to about 0.5 wt.% of at least one surfactant comprising at least one nonionic surfactant and, optionally, a cationic surfactant, and wherein the at least one surfactant excludes anionic and amphoteric surfactants;

(d) about 95 to about 99.8 wt.% of at least one water-soluble solvent or solubilizer comprising water and at least one compound which is an alcohol, an alkylene glycol, and a glycol ether, wherein water is the major constituent of the at least one solvent or solubilizer; and

(e) optionally, one or more adjuvants selected from fragrances and colorants;

wherein the composition has a pH of about 6 to about 9, and weight total of the composition is based on 100 wt.%.

2. The anti-bacterial cleaning composition of claim 1, wherein the pH adjustor comprises white distilled vinegar and an amine.

3. The anti-bacterial cleaning composition of claim 2, wherein the amine is an alkanolamine.

4. The anti-microbial cleaning composition of any one of claims 1 to 3, wherein the at least one nonionic surfactant is one or more of an alkoxylated linear alcohol, alkanolamide, amine oxide, or ethoxylated fatty ester.

5. The anti-bacterial cleaning composition of any one of claims 1 to 4, further comprising a propellant.

6. The anti-bacterial cleaning composition of claim 5, wherein the propellant is a compressed gas or a hydrocarbon.

7. The anti-bacterial cleaning composition of any one of claims 1 to 6, wherein the furniture surfaces include surfaces made of wood, wood laminate, combination of wood and glass, marble, granite, stainless steel, or combination thereof.

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8. The anti-bacterial cleaning composition of any one of claims 1 to 7, wherein the composition is impregnated in a wipe or dispersed from a trigger sprayer.

9. The anti-bacterial cleaning composition of any one of claims 1 to 8, wherein

(a) the at least one quaternary ammonium compound is present in an amount of about 0.005 to about 0.15 wt.%;

(b) the pH adjustor is present in an amount of about 0.05 to about 1 wt.%;

(c) the at least one surfactant is present in an amount of about 0.01 to about 0.2 wt.%; and

(d) the at least one water-soluble solvent or solubilizer is present in an amount of about 97.5 to about 99.8 wt.%.

10. The anti-bacterial cleaning composition of claim 9, wherein the pH is about 7 to about 9.

11. The anti-bacterial cleaning composition of any one of claims 1 to 10, wherein

(a) the at least one quaternary ammonium compound is present in an amount of about 0.01 to about 0.1 wt.%;

(b) the pH adjustor is present in an amount of about 0.2 to about 0.6 wt.%;

(c) the at least one surfactant is present in an amount of about 0.04 to about 0.12 wt.%; and

(d) the at least one water-soluble solvent or solubilizer is present in an amount of about 98.5 to about 99.8 wt.%.

12. The anti-bacterial cleaning composition of claim 11, wherein the pH is about 8 to about 9.

13. Anti-bacterial cleaning composition for application on furniture surfaces to clean and disinfect such surfaces without streaking comprising

(a) about 0.001 to 0.25 wt.% of at least one quaternary ammonium chloride compound;

(b) about 0.05 to about 1 wt.% white distilled vinegar;

(c) about 0.05 to about 1 wt.% alkanolamine;

(d) about 95 to about 99.8 wt.% of a water-soluble solvent or solubilizer comprising water, an alcohol, an alkylene glycol ether, and an alkylene glycol, wherein the water is the major constituent of the water-soluble solvent or solubilizer;

(e) about 0.001 to about 0.5 wt.% of at least one surfactant comprising at least one nonionic surfactant and, optionally, a cationic surfactant, and wherein the at least one surfactant excludes anionic and amphoteric surfactants; and

(f) optionally, one or more adjuvants selected from fragrances and colorants;

wherein the composition has a pH of about 6 to about 9, and weight total of the composition is based on 100 wt.%.

14. The anti-bacterial cleaning composition of claim 13, wherein the at least one nonionic surfactant comprises an alkoxylated linear alcohol.

15. The anti-bacterial cleaning composition of claim 14, wherein the alkoxylated linear alcohol is an ethoxylated linear alcohol.

16. The anti-bacterial cleaning composition of claim 15, wherein the ethoxylated linear alcohol is a C_{6-17} ethoxylated linear alcohol with 3-6 ethylene oxide groups.

17. The anti-bacterial cleaning composition of any one of claims 13 to 16 further comprising a propellant.

18. The anti-bacterial cleaning composition of claim 17, wherein the propellant is a compressed gas or a hydrocarbon.

19. The anti-bacterial cleaning composition of any one of claims 13 to 18, wherein the composition is impregnated in a wipe or dispensed from a trigger sprayer.

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