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(57) Abrégé/Abstract:
Composition for use as a hard surface cleaner, sanitizer and/or disinfectant, said composition comprising: an alkanesulfonic acid; a source of peroxide; an effective amount of a stabilizer; and water.

ABSTRACT

Composition for use as a hard surface cleaner, sanitizer and/or disinfectant, said composition comprising: an alkanesulfonic acid; a source of peroxide; an effective amount of a stabilizer; and water.

HARD SURFACE CLEANER

FIELD OF THE INVENTION

The invention is directed to a hard surface cleaner, sanitizer and/or disinfectant especially adapted to be used on hard surfaces, more specifically, to aqueous acidic compositions used as a hard surface cleaner, sanitizer and/or disinfectant.

BACKGROUND OF THE INVENTION

Microorganisms such as bacteria, fungi, viruses, or algae are present in every single environment inhabited by humans. While microorganisms are frequently an essential part of ecological systems; industrial processes; and human bodily functions, such as digestion, some microorganisms are highly undesirable. They may be the source of widespread illness, disease and even death for animals as well as humans.

In times of pandemics, such as the COVID-19 pandemic of 2020, there is a need for cleaning, sanitizing, and/or disinfecting establishments, health care facilities and food supply chains. To prevent the spread of non-airborne microorganisms, viruses, and pathogens, surfaces must be cleaned, sanitized and disinfected. The type and prevalence of microorganisms present depends on a number of factors, among which are: the availability of nutrients and moisture; humidity levels; temperature; and surface roughness. Certain microorganism bacteria are capable of remaining viable in a dormant state on floors or on objects for long periods of time until they are deposited in the proper media for growth.

Nutrients for microorganisms are typically abundant. For example, dried skin, discarded food, plants, animal wastes, synthetic and natural materials like: plastic coatings and objects, wood, paper, and natural fibers are all excellent nutrient media for many types of microorganisms, including potentially damaging organisms.

A major hurdle in the health care field is the prevention of the spread of dangerous infectious diseases by microorganisms. Facilities such as hospitals and long-term care facilities can become dangerous incubators of diseases as many of the patients are in a weakened condition due to illness. A microorganism that would not be a major threat to a healthy person can be fatal to someone with a compromised immune system. Potentially dangerous microorganisms are spread in health care facilities and elsewhere by a variety of means, including wheelchairs, ramps, door handles, food trays, etc. Good and thorough cleaning of all types of hard surfaces, such as the previously mentioned items, with

appropriate compositions helps in slowing down the growth or containing the spread of such microorganisms.

Quaternary ammonium-based liquid hard surface cleaners are commonly used, typically as bathroom cleaners. Certain quaternary ammonium compounds can be effective antimicrobial agents in small dosages in these cleaners. However, quaternary ammonium compounds are lung irritants and can contribute to asthma and other breathing problems. They are also known as skin irritants, where their use may lead to unsightly rashes. Some recent data seems to indicate that exposure to quaternary ammonium compounds harms sperm quality, reduces fertility and results in birth defects in mice. Moreover, as the presence of the quaternary ammonium compounds lingers on surfaces treated with such cleaning compounds for long periods of time, it is thought that this is a factor in the emergence of viruses which are resistant to these compounds. Since such compounds linger for a period of time after application, even after wiping off, it is not recommended to use these types of compounds in and around food preparation areas or food handling areas. Hence, both residential and commercial kitchens as well as food processing plants should avoid the presence and use of quaternary ammonium compounds.

Baker et al., U.S. Pat. No. 4,690,779, demonstrated a hard surface cleaner having improved non-streaking/filming properties in which a combination of low molecular weight polymer (e.g., polyethylene glycol) and certain surfactants were combined.

Corn et al., E.P. 0393772 and E.P. 0428816, describe hard surface cleaners containing anionic surfactants with ammonium counterions, and additional adjuncts.

G.B. 2,160,887 describes a cleaning system in which a combination of nonionic and anionic surfactants (including an alkanolamine salt alkyl sulfate) is contended to enhance cleaning efficacy.

U.S. Pat. No. 5,252,245, U.S. Pat. No. 5,437,807, U.S. Pat. No. 5,468,423, and U.S. Pat. No. 5,585,342, disclose improved glass and surface cleaners which combine either amphoteric or nonionic surfactants with solvents and effective buffers to provide excellent streaking/filming characteristics on glass and other smooth, glossy surfaces but which lack the presence of bactericides, such as quaternary ammonium compounds.

In food processing and handling there are several types of microbes, bacteria or other microorganisms with which food may come into contact. Much research has been done on such bacteria

and the following provides a lower pH limit which still allows for microbial growth for the specific type of bacteria: *Clostridium perfringens* (min. pH for growth: 5.5 - 5.8); *Vibrio vulnificus* (min. pH for growth: 5); *Bacillus cereus* (min. pH for growth: 4.9); *Campylobacter spp.* (min. pH for growth: 4.9); *Shigella spp.* (min. pH for growth: 4.9); *Vibrio parahaemolyticus* (min. pH for growth: 4.8); *Clostridium botulinum toxin* (min. pH for growth: 4.6); *Clostridium botulinum growth* (min. pH for growth: 4.6); *Staphylococcus aureus growth* (min. pH for growth: 4); *Staphylococcus aureus toxin* (min. pH for growth: 4.5); *Enterohemorrhagic Escherichia coli* (min. pH for growth: 4.4); *Listeria monocytogenes* (min. pH for growth: 4.39); *Salmonella spp* (min. pH for growth: 4.21); and *Yersinia enterocolitica* (min. pH for growth: 4.2).

Mildly acidic cleaners are used to dissolve hard water deposits, remove mild rust stains, and eliminate soap film from around the sink and on shower doors. They are useful in removing tarnish from brass and copper. Vinegar (acetic acid) and lemon juice (citric acid) are two of the most common mild acids found in cleaning compositions. Compositions made from those mild acids are generally safe for children and pets. Other acids are often found in household cleaning products. Vinegar removes hard water deposits from glassware, rust stains from sinks, and tarnish from brass and copper. Citric acid is a natural substance found in lemons, limes, oranges, and grapefruits. It is nontoxic, antibacterial, and antiseptic. In general, its applications mirror those of vinegar. Some commercial products containing citric acid are water-based and may cause corrosion or rust on metals. It is therefore preferably to wash and dry the metal after cleaning with citric acid to prevent the formation of rust. Phosphoric acid is mild, but more acidic than vinegar or lemon juice. Generally employed for rust removal, it is generally restricted to bathroom cleaners. Commercial products employing phosphoric acid include: tub, tile, sink, and toilet bowl cleaners.

Strongly acidic cleaners are highly toxic. They may be corrosive to the surfaces on which they are applied, meaning they can eat away at metal surfaces or human tissue (such as eyes and skin). Their use requires protective clothing (gloves, safety glasses, etc.) and careful application to avoid damaging materials other than those which require cleaning. Among the acids considered strong acids, there are hydrochloric acid and sulfuric acid. Hydrochloric acid is found in some toilet bowl cleaners to remove dirt and grime. It is very corrosive to metals. In commercial products, hydrochloric acid can be used to clean concrete by etching away the top layer. Sulfuric acid is a strong drain cleaner and can be found in some toilet bowl cleaners. It also is a powerful oxidizer.

Other acids which may be mistakenly considered strong acids include: hydrofluoric acid (used as a commercial rust remover) with the main drawback in that it will burn the skin. One must also take care to avoid exposing glass windows or glass products, which will be etched or dissolved. Oxalic acid is a

bleaching agent used to remove rust. It is, however, quite toxic if it is inhaled or swallowed, and corrosive. It can be ingested indirectly if the surfaces cleaned (i.e. utensils, bowls, plates, etc.) come into contact with food destined for consumption.

Other compounds such as sodium bisulfate (found in some toilet bowl cleaners) is a poison and requires extreme caution; and sodium hypochlorite (found in some in bleaching solutions, disinfectants, water purifiers, and cleaning products). Sodium hypochlorite when used as a disinfectant destroys bacteria, viruses, and mold. Breathing or ingesting this compound may cause poisoning.

In light of the prior art and limits for microbial growth for a number of extremely problematic bacteria, the inventors have devised a novel approach for the cleaning of hard surfaces all the while minimizing the use of chemicals such as quaternary amines, which for all the benefits they provide have some drawbacks in their use and/or manufacture.

Hydrogen peroxide has been used as an antiseptic since the 1920s because it kills bacteria cells by destroying their cell walls. It does so through the process of oxidation. Unfortunately, peroxides as a group are not stable molecules.

In order to clean surfaces from the possible presence of viruses, the U.S. Centers for Disease Control and Prevention (the CDC) recommends first cleaning surfaces with soap and water, and then disinfecting them with EPA-registered household disinfectants which include: diluted bleach (the CDC recommends one part bleach to 50 parts water, while the Public Health Agency of Canada recommends one part bleach to nine parts water); and solutions containing at least 70 per cent alcohol. The two-step approach may work for some, but can also cause problems for others and is much more difficult to apply in an industrial (read manufacturing, warehouses or slaughterhouses for example) setting.

In light of the above, there still exists a need for an improved composition for cleaning and sanitizing hard surfaces which is cost effective and carries little or no future impact on the environment and/or on the possibility of microorganism adaptation. The present invention addresses the drawbacks of the prior art by providing an effective surface cleaning composition which combines a low pH with an oxidizing agent to ensure a substantially complete destruction of bacteria on a hard surface without resorting to alcohol-based solution.

SUMMARY OF THE INVENTION

According to an aspect of the present invention, there is provided an aqueous, antimicrobial hard surface cleaning composition, said composition comprising:

- an alkanesulfonic acid;
- a source of peroxide;
- an effective amount of a stabilizer; and
- water.

According to an object of the present invention, there is provided a method to improve microorganism contaminant removal from hard surfaces. According to a preferred embodiment, the microorganism contaminant being removed is selected from the group consisting of: viruses, bacteria, fungi and microbes.

According to a preferred embodiment of the present invention, there is disclosed a method of cleaning and disinfecting a hard surface by applying a preferred composition to a contaminated surface and removing both from said surface.

Accordingly, there is a need, both in industry and in the home, for a safe and effective microbiocidal cleaner, sanitizer and/or disinfectant that can be used on a wide variety of surfaces.

According to a preferred embodiment of the present invention, there is provided a microbiocidal cleanser or disinfectant that will kill or inhibit a wide variety of microorganisms.

According to a preferred embodiment of the present invention. there is provided a microbiocidal cleaner, sanitizer and/or disinfectant that is safe for use around humans and animals.

It is an object of the present invention to provide a hard surface cleaner which does not exhibit long term latency as is found with quaternary ammonium compounds.

According to an object of the present invention, there is provided a composition for use as a hard surface cleaner, disinfectant and/or sanitizer, said composition comprising:

- an alkanesulfonic acid;
- a source of peroxide;
- an effective amount of a stabilizer; and

- water.

Preferably, the alkanesulfonic acid is present in an amount ranging from 0.5 to 5 w/w% of the total weight of the composition.

Preferably, said source of peroxide is present in an amount ranging from 0.5 to 5 w/w% of the total weight of the composition.

Preferably also, said stabilizer is present in an amount ranging from 0.05 to 1 w/w% of the total weight of the composition.

According to a preferred embodiment of the present invention, the alkanesulfonic acid is selected from the group consisting of: methanesulfonic acid; ethanesulfonic acid; propanesulfonic acid; butanesulfonic acid; pentanesulfonic acid; hexanesulfonic acid; and combinations thereof. Preferably, the alkanesulfonic acid is methanesulfonic acid.

According to a preferred embodiment of the present invention, the source of peroxide is selected from the group consisting of: hydrogen peroxide; benzoyl peroxide; percarbonates; perborates; persulfates; and combinations thereof. Preferably, the peroxide is hydrogen peroxide.

According to a preferred embodiment of the present invention, the stabilizer is an alkanolamine.

According to a preferred embodiment of the present invention, the stabilizer is selected from the group consisting of: taurine and derivatives thereof such as taurine-related compounds. Preferably, the taurine-related compound is selected from the group consisting of: taurolidine; taurocholic acid; tauroselcholic acid; tauromustine; 5-taurinomethyluridine and 5-taurinomethyl-2-thiouridine; homotaurine (tramiprosate); acamprosate; and taurates.

According to a preferred embodiment of the present invention, the alkanolamine is selected from the group consisting of: monoethanolamine; diethanolamine; triethanolamine; and combinations thereof. More preferably, the alkanolamine is monoethanolamine. According to another preferred embodiment of the present invention, the alkanolamine is diethanolamine. According to yet another preferred embodiment of the present invention, the alkanolamine is triethanolamine.

According to a preferred embodiment of the present invention, the composition has a pH of less than 3. Preferably, the composition has a pH of less than 2. Even more preferably, the composition has a pH of less than 1.

According to an object of the present invention, there is provided a method of cleaning a hard surface, wherein said method comprises the steps of:

- providing a composition according to the above;
- providing a surface which requires cleaning; and
- applying the composition onto said surface for a duration of time sufficiently long enough to destroy microorganisms present on said surface.

According to another object of the present invention, there is provided a method of disinfecting a hard surface, wherein said method comprises the steps of:

- providing a composition according to the above;
- providing a surface which requires disinfecting; and
- applying the composition onto said surface for a duration of time sufficiently long enough to destroy microorganisms present on said surface.

According to yet another object of the present invention, there is provided a method of sanitizing a hard surface, wherein said method comprises the steps of:

- providing a composition according to the above;
- providing a surface which requires sanitizing; and
- applying the composition onto said surface for a duration of time sufficiently long enough to destroy microorganisms present on said surface.

DETAILED DESCRIPTION OF THE INVENTION

The present invention is an aqueous acidic composition for cleaning, sanitizing, and/or disinfecting hard surfaces.

According to a preferred embodiment of the present invention, the composition is a multi-purpose aqueous acid hard surface cleaner, sanitizer, and/or disinfectant. Preferably, these types of cleaners are intended to clean hard surfaces by application of a metered discrete amount of the cleaner, typically by pump or trigger sprayer onto the surface to be cleaned or onto the workpiece, such as a soft cloth or sponge, and then wiping the surface, thus removing contaminants present. According to another preferred

embodiment, the composition may be applied by pouring a pre-determined amount onto a surface and subsequently removing such with a cloth or the like.

According to an aspect of the present invention, there is provided a composition for cleaning a hard surface comprised of:

- an alkanesulfonic acid;
- a source of peroxide;
- an effective amount of a stabilizer; and
- water.

According to a preferred embodiment of the present invention, the alkanesulfonic acid is present in an amount ranging from 0.5 to 5 w/w% of the total weight of the composition.

According to a preferred embodiment of the present invention, the source of peroxide is present in an amount ranging from 0.5 to 5 w/w% of the total weight of the composition.

According to a preferred embodiment of the present invention, the stabilizer is present in an amount ranging from 0.05 to 1 w/w% of the total weight of the composition.

According to a preferred embodiment of the present invention, when used for example, in agricultural applications, the content of alkanesulfonic acid and the source of peroxide can have a concentration of up to 20 w/w%. Some farm installations on farms may require, at some point in time, the application of a composition capable of cleaning, disinfecting and or sanitizing large surfaces contaminated with high quantities of microbes or other toxins. In those instances, it may be preferable to use a composition of alkanesulfonic acid and peroxide of 10 w/w/% or even up to 20 w/w %. Large surfaces treated are typically sprayed with the composition and allowed to drip and drain into a large drain which, if left untreated, may be directed to an external environment with no further treatment. In such cases, it is highly desirable to have a composition which is readily biodegradable.

Preferably the alkanesulfonic acid is selected from the group consisting of: methanesulfonic acid; ethanesulfonic acid; propanesulfonic acid; butanesulfonic acid; pentanesulfonic acid; hexanesulfonic acid; and combinations thereof.

According to a preferred embodiment of the present invention, the compound comprising a sulfonic acid moiety is methanesulfonic acid (MSA). MSA is a desirable acid to use as it is virtually non-fuming and biodegradable. Hence, once the acid composition has been used it can be rinsed and disposed of in the environment and will not cause any unwanted effects. Moreover, MSA can be used on several types of metallic surfaces including stainless steel on which many food processing operations are carried out without corroding or rusting the surface.

Preferably, the source of peroxide is selected from the group consisting of: hydrogen peroxide; benzoyl peroxide; percarbonates; perborates; persulfates; and combinations thereof. Preferably, the source of peroxide is hydrogen peroxide. Preferably, any cheap source of peroxide should be considered.

According to a preferred embodiment of the present invention, the stabilizer is an alkanolamine.

According to a preferred embodiment of the present invention, the stabilizer is taurine and derivatives thereof such as taurine-related compounds. Preferably, the taurine-related compound is selected from the group consisting of: taurolidine; taurocholic acid; tauroselcholic acid; tauromustine; 5-taurinomethyluridine and 5-taurinomethyl-2-thiouridine; homotaurine (tramiprosate); acamprosate; and taurates.

According to a preferred embodiment of the present invention, the alkanolamine is selected from the group consisting of: monoethanolamine; diethanolamine; triethanolamine; and combinations thereof. Preferably, the alkanolamine is monoethanolamine.

According to another preferred embodiment of the present invention, the alkanolamine is diethanolamine.

According to yet another preferred embodiment of the present invention, the alkanolamine is triethanolamine.

According to a preferred embodiment of the present invention, the composition has a pH of less than 3. Preferably, the composition has a pH of less than 2.

According to another preferred embodiment of the present invention, the composition has a pH of less than 1.

According to another aspect of the present invention, there is provided a method of cleaning a hard surface, wherein said method comprises the steps of:

- providing a composition according to any one of claims 1 to 16;
- providing a surface which requires cleaning; and
- applying the composition onto said surface for a duration of time sufficiently long enough to destroy micro-organisms present on said surface.

Preferably, additional additives such as fragrance, dye and the like can be included to provide desirable attributes to the composition.

In the present description, effective amounts are generally those amounts listed as the ranges or levels of ingredients in the descriptions which follow hereto. Unless otherwise stated, amounts listed in percentage ("%'s") are in weight percent of the composition.

Water

According to a preferred embodiment of the present invention, the composition is mainly comprised of water with relatively low levels of active ingredients such as acid and peroxide.

According to a preferred embodiment deionized water is used. According to another preferred embodiment tap water is used. Preferably, the type of water can be selected from the group consisting of: reverse osmosis; deionized; distilled and tap water.

According to a preferred embodiment of the present invention, the composition further comprises at least one surfactant. Preferably, the surfactant can be selected from the group consisting of: anionic; cationic; non-ionic; and amphoteric surfactants. Preferably, the amphoteric surfactant is selected from the group consisting of: a sultaine surfactant; a betaine surfactant; and combinations thereof. More preferably, the sultaine surfactant and betaine surfactant are selected from the group consisting of: an amido betaine surfactant; an amido sultaine surfactant; and combinations thereof. Yet even more preferably, the amido betaine surfactant and is selected from the group consisting of: an amido betaine comprising a hydrophobic tail from C_8 to C_{16}. Most preferably, the amido betaine comprising a hydrophobic tail from C_8 to C_{16} is cocamidobetaine.

Preferably also, the corrosion inhibition package further comprises an anionic surfactant. Preferably, the anionic surfactant is a carboxylic surfactant. More preferably, the carboxylic surfactant is a dicarboxylic surfactant. Even more preferably, the dicarboxylic surfactant comprises a hydrophobic tail ranging from C_8 to C_{16}. Most preferably, the dicarboxylic surfactant is sodium lauriminodipropionate

Preferably, the surfactant is selected from the group consisting of: cocamidopropyl betaine; β-Alanine, N-(2-carboxyethyl-N-dodecyl-, sodium salt (1:1); and a combination thereof.

According to a preferred embodiment of the present invention, the composition further comprises an amine oxide surfactant. Such surfactants are desirable as they have good foaming properties and can help in the removal of solid contaminants when cleaning; disinfecting; and/or sanitizing hard surfaces.

According to a preferred embodiment of the present invention, a small amount of additives can be incorporated for improving the cleaning performance or aesthetic qualities of the cleaner. Adjuncts for cleaning include additional surfactants, such as those described in Kirk-Othmer, Encyclopedia of Chemical Technology 3rd Ed., Volume 22, pp. 332-432 (Marcel-Dekker, 1983), which are incorporated herein by reference. Aesthetic adjuncts include fragrances, such as those available from Givaudan, IFF, Quest and others, and dyes and pigments which can be solubilized or suspended in the formulation, such as diaminoanthraquinones. The amount of these cleaning and aesthetic additives should remain low and should preferably not consist of more than 1 % by weight of the total weight of the composition.

Example 1

According to a preferred embodiment of the present invention, a composition was prepared by admixing water, methanesulfonic acid and hydrogen peroxide to yield a concentration of each component as follows:

Methanesulfonic acid	-	0.70 w/w%
Hydrogen peroxide	-	1.00 w/w%
Stabilizer	-	0.10 w/w%
Water	-	98.2 w/w%

The pH of the resulting composition was between 1.2 and 1.4. The stabilizer selected for Example 1 was monoethanolamine.

Example 2

According to a preferred embodiment of the present invention, a composition was prepared by admixing water, methanesulfonic acid and hydrogen peroxide to yield a concentration of each component as follows:

Methanesulfonic acid	-	1.75 w/w%
Hydrogen peroxide	-	2.50 w/w%
Stabilizer	-	0.25 w/w%
Water	-	95.55 w/w%

The pH of the resulting composition was below 1. The stabilizer selected for Example 1 was monoethanolamine.

Example 3

According to a preferred embodiment of the present invention, a composition was prepared by admixing water, methanesulfonic acid and hydrogen peroxide to yield a concentration of each component as follows:

Methanesulfonic acid	-	3.50 w/w%
Hydrogen peroxide	-	5.00 w/w%
Stabilizer	-	0.50 w/w%
Water	-	91.0 w/w%

The pH of the resulting composition was approximately 0.5. The stabilizer selected for Example 1 was monoethanolamine.

US DOT testing for stainless steel compatibility

Each one of the compositions of Example 1, 2 and 3 were exposed to stainless steel to show their compatibility therewith in accordance with the United States Department of Transportation (US DOT) testing for stainless steel compatibility. The compositions of Examples 1, 2, and 3 were placed in contact with stainless steel for a duration of 7 days at a temperature of 55 °C. The results of the corrosion testing are found in Table 1.

Table 1 - **Corrosion testing of Stainless Steel (316SS) for compositions according to preferred embodiment of the present invention at 55 °C for 7 days**

	Corrosion rate	
Composition	mm/year	lb/ft^2
Example 1	0.000	0.000
Example 2	0.000	0.000
Example 3	0.000	0.000

Based on the data of Table 1, the compositions of Examples 1, 2, and 3 all met the criteria for passing the test requirement of the US DOT stainless steel compatibility test.

Stability testing

The inventors have titrated the compositions of Examples 1, 2, and 3. The compositions were stored capped, but not sealed in a water bath at a constant temperature of 30 °C. The peroxide content in this type of composition is an indicator of the stability of the composition.

To determine the concentration of H_2O_2, the compositions were titrated against a standardized $KMnO_4$ solution.

The moles of H_2O_2 found in the titrated sample and the moles of H_2O_2 used in the preparation of the composition are used to calculate the percent yield. The results of the titration are found in Table 2 below.

Table 2 - **Titration results of composition according to Example 1**

	Example 1	Conventional composition
Composition	% peroxide at time of synthesis	% peroxide after 14 days
Example 1	1.2 +/- 0.05%	1.2 +/- 0.01%
Example 2	2.9 +/- 0.16%	3.0 +/- 0.05%
Example 3	5.7 +/- 0.09%	5.7 +/- 0.07%

NB: the presence of oxidizing species such as peroxomonosulfonic acid could account for the readings of higher than the peroxide content initially inputted in the composition, i.e. 1, 2.5 and 5%.

The titration shows that the compositions according to preferred embodiments of the present invention have displayed excellent peroxide stability over time. This has several beneficial effects

including: the ability to provide a product which has a significantly longer shelf life; increasing operational efficiency and supply chain management; and minimizing the waste resulting from expired product.

While the foregoing invention has been described in some detail for purposes of clarity and understanding, it will be appreciated by those skilled in the relevant arts, once they have been made familiar with this disclosure, that various changes in form and detail can be made without departing from the true scope of the invention in the appended claims.

CLAIMS

1. Composition for use as a hard surface cleaner, disinfectant and/or sanitizer, said composition comprising:

- an alkanesulfonic acid;
- a source of peroxide;
- an effective amount of a stabilizer; and
- water.

2. The composition according to claim 1, where said alkanesulfonic acid is present in an amount ranging from 0.5 to 5 w/w% of the total weight of the composition.

3. The composition according to claim 1 or 2, where said source of peroxide is present in an amount ranging from 0.5 to 5 w/w% of the total weight of the composition.

4. The composition according to claim 1 or 2, where said stabilizer is present in an amount ranging from 0.05 to 1 w/w% of the total weight of the composition.

5. The composition according to claim 1, where said alkanesulfonic acid is selected from the group consisting of: methanesulfonic acid; ethanesulfonic acid; propanesulfonic acid; butanesulfonic acid; pentanesulfonic acid; hexanesulfonic acid; and combinations thereof.

6. The composition according to any one of claims 1 to 5 where said compound comprising a sulfonic acid moiety is methanesulfonic acid.

7. The composition according to any one of claims 1 to 6, where said source of peroxide is selected from the group consisting of: hydrogen peroxide; benzoyl peroxide; percarbonates; perborates; persulfates; and combinations thereof.

8. The composition according to any one of claims 1 to 7, where the peroxide is hydrogen peroxide.

9. The composition according to any one of claims 1 to 8, where the stabilizer is an alkanolamine.

10. The composition according to any one of claims 1 to 8, where the stabilizer is selected from the group consisting of: taurine and derivatives thereof such as taurine-related compounds.

11. The composition according to claim 10, where the taurine-related compound is selected from the group consisting of: taurolidine; taurocholic acid; tauroselcholic acid; tauromustine; 5-taurinomethyluridine and 5-taurinomethyl-2-thiouridine; homotaurine (tramiprosate); acamprosate; and taurates.

12. The composition according to claim 9, where the alkanolamine is selected from the group consisting of: monoethanolamine; diethanolamine; triethanolamine; and combinations thereof.

13. The composition according to claim 9, where the alkanolamine is monoethanolamine.

14. The composition according to claim 9, where the alkanolamine is diethanolamine.

15. The composition according to claim 9, where the alkanolamine is triethanolamine.

16. The composition according to any one of claims 1 to 15, where the composition has a pH of less than 3.

17. The composition according to any one of claims 1 to 15, where the composition has a pH of less than 2.

18. The composition according to any one of claims 1 to 15, where the composition has a pH of less than 1.

19. Method of cleaning a hard surface, wherein said method comprises the steps of:

- providing a composition according to any one of claims 1 to 18;
- providing a surface which requires cleaning; and
- applying the composition onto said surface for a duration of time sufficiently long enough to destroy micro-organisms present on said surface.

21. Method of disinfecting a hard surface, wherein said method comprises the steps of:

- providing a composition according to any one of claims 1 to 18;

- providing a surface which requires disinfecting; and
- applying the composition onto said surface for a duration of time sufficiently long enough to destroy micro-organisms present on said surface.

21. Method of sanitizing a hard surface, wherein said method comprises the steps of:
- providing a composition according to any one of claims 1 to 18;
- providing a surface which requires sanitizing; and
- applying the composition onto said surface for a duration of time sufficiently long enough to destroy micro-organisms present on said surface.