(19) Europäisches Patentamt
European Patent Office
Office européen des brevets

(11) **EP 3 922 706 A1**

(12) **EUROPEAN PATENT APPLICATION**

(43) Date of publication:
15.12.2021 Bulletin 2021/50

(21) Application number: **20382501.3**

(22) Date of filing: **10.06.2020**

(51) Int Cl.:
C11D 3/48 *(2006.01)* ***C11D 3/39*** *(2006.01)*
C11D 3/20 *(2006.01)* ***C11D 3/36*** *(2006.01)*
C11D 7/26 *(2006.01)* ***C11D 7/36*** *(2006.01)*

(84) Designated Contracting States:
AL AT BE BG CH CY CZ DE DK EE ES FI FR GB GR HR HU IE IS IT LI LT LU LV MC MK MT NL NO PL PT RO RS SE SI SK SM TR
Designated Extension States:
BA ME
Designated Validation States:
KH MA MD TN

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(54) **A DISINFECTANT AND CLEANING COMPOSITION**

(57) The present invention relates to a composition comprising: from 0.5% to 4% by weight of hydrogen peroxide; from 0.1% to 0.5% by weight of an organic phosphonic acid; from 0.25% to 0.8% by weight of lactic acid; and having a pH from 2 to 3.6 and processes for its preparation. It also relates to its use as disinfectant and cleaner and a method of disinfecting and/or cleaning by applying it on a surface.

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Description

[0001] The present invention relates to the field of disinfection. In particular, it relates to a stable non-toxic and non-corrosive hydrogen peroxide-containing composition efficient for being used as disinfectant and cleaning composition. It also relates to processes for its preparation and a method for its use.

Background Art

[0002] Hydrogen peroxide solutions have been used for many years for a variety of purposes, including bleaching, disinfecting, and cleaning a variety of surfaces ranging from skin, hair, mucous membranes to contact lenses, instruments, household and industrial surfaces.

[0003] In particular, hydrogen peroxide compositions are specially attractive because hydrogen peroxide displays broad spectrum antimicrobial activity and because it decomposes into innocuous products (i.e. water and oxygen). Broad spectrum antimicrobial activity is important in situations where harmful organisms are present, but their identity is not known. Furthermore, apart from the disinfectant activity of the hydrogen peroxide, it is also a reference product due to its versatile effect as cleaner which helps to remove limescale, calcium stains and yellow spots.

[0004] Unfortunately, the use of hydrogen peroxide also involves some drawbacks. One of the most important problems of hydrogen peroxide compositions is the inherent instability of hydrogen peroxide solutions and the length of time required for hydrogen peroxide to disinfect a surface to which it had been applied. In fact, unless stringent conditions are met, hydrogen peroxide solutions begin to decompose into oxygen gas and water within an extremely short time. Typical hydrogen peroxide solutions in use for the above mentioned purposes are in the range from about 0.5% to about 10% by weight of hydrogen peroxide in water. The rate at which such dilute hydrogen peroxide solutions decompose will, of course, be dependent upon some factors such as pH and the presence of trace amounts of various metal impurities (such as copper or chromium), which may act as catalyst to decompose the same. Moreover, at moderately elevated temperatures the rate of decomposition of such dilute aqueous hydrogen peroxide solutions is greatly accelerated. Thus, a common difficulty in formulating such hydrogen peroxide composition is to ensure that it remains stable during storage but is sufficiently active on use, which is particularly difficult to achieve in liquid compositions.

[0005] One solution has been to stabilize the hydrogen peroxide by the addition of stabilizing agents. Usually, these stabilizing agents are chelators or sequestering agents which are added to hydrogen peroxide solutions to combat decomposition due to the presence of trace impurities (mainly dissolved metals). Many types of compounds have been used to fill this function, such as, diols; quinones; stannate salts; pyrophosphates; phenolsulfate; sodium stannate; N,N-lower alkyl aniline; sulfamic acid; sulfolane; and di-straight chain lower alkyl sulfones and sulfoxides; phosphonic acids and their salts; various aromatic compounds and amino carboxylic acid salts; acrylic acid polymers; polyphosphates; polyamino polyphosphonic acids and/or their salt.

[0006] However, many of the previously suggested compounds have various issues and challenges associated with them, such as toxicity, environmental impact and poor performance.

[0007] Apart from the toxicity and environmental impact concerns, many of these require a specific conditions to provide adequate hydrogen peroxide stability, such as specific pH levels or relatively low hydrogen peroxide concentrations. It is known in the state of the art, that the control of the pH of the hydrogen peroxide composition about 2.5 and 5.5, as well as the use of low hydrogen peroxide are appropriate for having stable composition but do not provide sufficient disinfectant, cleaning and/or bleaching power to be useful for many household and profesional situations.

[0008] Other disadvantages of the use of hydrogen peroxide are those related to its high toxicity and corrosive properties causing serious health and safety hazards. In particular, in high concentrations in laboratory or industrial settings, hydrogen peroxide is a strong oxidizer and can be corrosive to the eyes, skin, and respiratory system, causing burns to the skin and tissue damage. In fact, they are associated with occupational safety. In lower concentrations as "household-grade" concentrations, hydrogen peroxide is generally considered safe to use, but should never be inhaled and/or ingested. In fact, even at low concentrations, the hydrogen peroxide should be handled and stored with care whether at home or in the workplace.

[0009] Furthermore, it is known that hydrogen peroxide is highly corrosive having important material imcompatibility problems. In particular, hydrogen peroxide can damage both metallic surface such as tubes and metal instruments, and organic material surfaces such carbonate based surfaces (such as marble) which is neither desirable. However, in most of the cases, the reduction of the undesirable corrosive effect of hydrogen peroxide solutions is achieved by lowering the amount of active ingredients or the increase of the pH values, compromising its disinfectant and/or cleaning activity. In particular, when the cleaning activity is specially critical implying the removal of lime, calcium stains, yellow spots as well as the removal of soap (foam, scum and stains) and grease, the addition of active ingredients having one or more of the above-mentioned activities is required. However, the introduction of more components, and particularly active ingredients, can hinder the preparation of compositions since certain components can affect to the stability and/or the activity of other components of the composition.

[0010] Therefore, from what is known in the art, it is derived that there is still the need of providing a stable, safety, disinfectant and cleaning hydrogen peroxide compositions without having material compatibility problems.

Summary of Invention

[0011] The inventors have provided a stable hydrogen peroxide composition having an efficient disinfectant activity and achieving a very thorough and at the same time broad cleaning effect.

[0012] In particular, the inventors have found that the use of a low amount of hydrogen peroxide (from 0.5% to 4%) and lactic acid (from 0.25% to 0.8%) in combination with an amount of organic phosphonic acid from 0.1% to 0.5% allows providing a stable composition for being stored without decomposition of the hydrogen peroxide; and having at the same time the appropriate pH and concentration of active ingredients for providing an efficient dual disinfectant and cleaning effect. These effects are performed without causing corrosion and/or damage to the surface that have been treated. And, further, without causing inhalatory problems and skin damage to the person that is applying the composition on the surface that have been treated.

[0013] As previously indicated, in this type of composition there are interactions between the components that can affect its activity and/or the stability of the composition. Specifically, the organic phosphonic acid is known to efficiently stabilize hydrogen peroxide. However, inventors have surprinsingly found that the organic phosphonic acid has a negative effect for the lactic acid present in the composition, greatly compromising its anti lime effect. In fact, the inventors have surprisingly found that contrary to the stablished knowledge in the state of the art, the increase of the amount of the lactic acid in the presence of the organic phosphonic acid does not improve the anti lime effect of the composition but undesirably increase the incompatibility with the materials commonly use at both homeplace and workplace and instruments. On the contrary, the decrease in the amount of the lactic acid below the typically concentration used in this type of compositions until the claimed amount of lactic acid (from 0.25% to 0.8%) of the compositions of the present invention in combination with an amount of organic phophonic acid from 0.1% to 0.5% allows having an optimal stabilization of the hydrogen peroxide and the dual and broad disinfectant and cleaning effect without compromising the safety, toxicity and compatibility with the surfaces to treat.

[0014] As it is shown in the experimental data, on one hand, the composition of the present invention has a broad spectrum antimicrobial activity at short exposure time (about 5 min agaisnt bacterias and enveloped viruses). In particular, the composition has proved to be efficient against gram-positive and gram negative bacteria, fungi and enveloped virus without the need of rinsing the surface after application even at low amounts of hydroxy peroxide. In fact, due to its harmlessness, it is also appropriate for the treatment of surfaces which are usually in contact with food.

[0015] On the other hand, as it is also demonstrated in the Examples, the composition of the invention is useful as cleaning product because it is capable of removing lime, soap (foam, scum and stains) and grease from non-living surfaces, without damaging the treated surface thanks to the very low or nule reactivity towards materials, substrates and tissues. Therefore, the composition of the invention have a efficient cleaning activity of any surface regardless that a lime scale effect, a soap removal activity and/or a grease removal effect is needed. In fact, the composition of the invention includes the appropriate active cleaning ingredients and achieves a very thorough and broad cleaning effect without affecting the disinfectant activity nor the stability of the composition.

[0016] Finally, the present application also includes a toxicity, irritability and corrosion test which shows that the composition of the invention can be considered non-toxic, non-irritant and safety for being use as disinfectant and cleaning of non-living surfaces even those which are formed or have metals or delicate organic materials. In addition, the use of the composition of the invention with a low amount of the active ingredients, particularly hydrogen peroxide, results in an improved shelf life and ease packaging without involving any health and safety hazards.

[0017] Thus, the first aspect of the invention relates to a composition comprising:from 0.5% to 4% by weight of hydrogen peroxide; from 0.1% to 0.5% by weight of an organic phosphonic acid; from 0.25% to 0.8% by weight of lactic acid; and having a pH from 2 to 3.6.

[0018] The second aspect of the invention relates to a process for the preparation of the composition of the first aspect of the invention.

[0019] The third aspect of the invention relates to a use of the composition of the first aspect of the invention as disinfectant and cleaner.

[0020] Finally, the fourth aspect of the invention relates to a method of disinfecting and cleaning a non-living surface comprising applying a composition as defined in the first aspect of the invention.

Detailed description of the invention

[0021] All terms as used herein in this application, unless otherwise stated, shall be understood in their ordinary meaning as known in the art. Other more specific definitions for certain terms as used in the present application are as set forth below and are intended to apply uniformly throughout the specification and claims unless an otherwise expressly

set out definition provides a broader definition.

[0022] For the purposes of the present invention, any ranges given include both the lower and the upper endpoints of the range. Ranges and values given, such as temperatures, times, and the like, should be considered approximate, unless specifically stated.

[0023] The term "percentage (%) by weight" refers to the percentage of each ingredient of the composition in relation to the total weight.

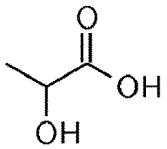
[0024] The term "about" or "around" as used herein refers to a range of values ± 10% of a specified value. For example, the expression "about 10" or "around 10" includes ± 10% of 10, i.e. from 9 to 11.

[0025] The first aspect refers to a stable disinfectant and cleaning comprising from 0.5% to 4% by weight of hydrogen peroxide; from 0.1% to 0.5% by weight of an organic phosphonic acid, particularly 1-hydroxyethylidene-1,1-diphosphonic acid; from 0.25% to 0.8% by weight of lactic acid; and having a pH from 2 to 3.6.

[0026] In an embodiment, the composition comprises from 0.5% to 4% by weight of hydrogen peroxide. In an embodiment, the composition comprises from 1% to 3.5% by weight of hydrogen peroxide. In an embodiment, the composition comprises from 1% to 3% by weight of hydrogen peroxide. In an embodiment, the composition comprises from 1.5% to 3% by weight of hydrogen peroxide. In an embodiment, the composition comprises from 1.5% to 2.5% by weight of hydrogen peroxide. In an embodiment, the composition comprises about 1.5% by weight of hydrogen peroxide. In an embodiment, the composition comprises from 0.5% to lower than 2% by weight of hydrogen peroxide. In an embodiment, the composition comprises from 1% to lower than 2% by weight of hydrogen peroxide. In an embodiment, the composition comprises about 1.5% by weight of hydrogen peroxide. In an embodiment, the composition comprises from equal to or higher than 2% to 4% by weight of hydrogen peroxide. In an embodiment, the composition comprises from equal to or higher than 2.5% to 3.5% by weight of hydrogen peroxide. In an embodiment, the composition comprises about 2.5% by weight of hydrogen peroxide. As it is mentioned above, the compositions of the present invention are advantegeous because have a dual effect as disinfectant and cleaner (anti-lime and soap removal). Particularly, the compositions of the present invention have bactericidal, fungicidal and viricidal activity.

[0027] The composition of the present invention comprises from 0.1% to 0.5% by weight of an organic phosphonic acid. In an embodiment, the composition comprises from 0.18% to 0.4% by weight of an organic phosphonic acid. In an embodiment, the composition comprises from 0.2% to 0.35% by weight of an organic phosphonic acid. In an embodiment, the composition comprises from 0.2% to 0.3% by weight of an organic phosphonic acid. In an embodiment, the composition comprises about 0.3% by weight of an organic phosphonic acid. The term "organic phosphonic acid" encompasses organic monophosphonic acids and organic biphosphonic acids. In an embodiment, the composition is one wherein the organic phosphonic acid is selected from th group consisting of dimethylaminomethane diphosphonic acid, 1-amino-1-phenylmethane diphosphonic acid, amino tri-(methylene phosphonic acid) (ATMP),ethylene diamine tetra -(methylene phosphonic acid) (EDTMP), 2-hydroxyphosphonocarboxylic Acid (HPAA), 2-phosphonobutane -1,2,4-tricarboxylic acid (PBTCA), polyhydric alcohol phosphate ester (PAPE), bis-(hexamethylene triamine penta(methylene phosphonic acid)) (BHMTPMPA), aminoacetic acid-N-di-(methylene phosphonic acid), diethylenetriamine penta(methylene) phosphonic (DTMPA) acid and 1-hydroxyethane-1,1-diphosphonic acid. In an embodiment, the composition is one wherein the organic phosphonic acid is 1-hydroxyethylidene-1,1-diphosphonic acid. The terms 1-hydroxyethylidene-1,1-diphosphonic acid and etidronic acid, and the abbreviature HEDP refers to the same compound which are commercially available with the name Dequest 2010 LC.

[0028] The composition of the invention comprises from 0.25% to 0.8% by weight of lactic acid. In an embodiment, the composition comprises from 0.25% to 0.75% by weight of lactic acid. In an embodiment, the composition comprises from 0.3% to 0.75% by weight of lactic acid. In an embodiment, the composition comprises from 0.35% to 0.75% by weight of lactic acid. In an embodiment, the composition comprises from 0.35% to 0.5% by weight of lactic acid. In an embodiment, the composition comprises about 0.35% by weight of lactic acid. The term "lactic acid" is the International Non-proprietary Name of 2-hydroxypropionic acid having the CAS number 50-21-5. The structure of the lactic acid corresponds to the following formula:



[0029] In an embodiment, the composition comprises:

from 1% to 3.5% by weight of hydrogen peroxide;
from 0.18% to 0.4% by weight of an organic phosphonic acid, particularly 1-hydroxyethylidene-1,1-diphosphonic acid;
from 0.25% to 0.75% by weight of lactic acid; and

having a pH from 2 to 3.6; particularly from 2.4 to 3.2.

[0030] In an embodiment, the composition comprises:

from 1% to 3% by weight of hydrogen peroxide;
from 0.2% to 0.35% by weight of an organic phosphonic acid, particularly 1-hydroxyethylidene-1,1-diphosphonic acid;
from 0.3% to 0.75% by weight of lactic acid; and
having a pH from 2 to 3.6; particularly from 2.4 to 3.2.

[0031] In an embodiment, the composition comprises:

from1.5% to 3% by weight of hydrogen peroxide;
from 0.2% to 0.3% by weight of an organic phosphonic acid, particularly 1-hydroxyethylidene-1,1-diphosphonic acid;
from 0.35% to 0.75% by weight of lactic acid; and
having a pH from 2 to 3.6; particularly from 2.4 to 3.2.

[0032] In an embodiment, the composition comprises:

from 1.5% to 2.5% by weight of hydrogen peroxide;
from 0.2% to 0.3% by weight of an organic phosphonic acid, particularly 1-hydroxyethylidene-1,1-diphosphonic acid;
from 0.35% to 0.5% by weight of lactic acid; and
having a pH from 2 to 3.6; particularly from 2.4 to 3.2.

[0033] In an embodiment, the composition comprises:

about 1.5% by weight of hydrogen peroxide;
about 0.3% by weight of an organic phosphonic acid, particularly 1-hydroxyethylidene-1,1-diphosphonic acid; about 0.35% by weight of lactic acid; and
having a pH from 2 to 3.6; particularly from 2.4 to 3.2.

[0034] In an embodiment, the composition comprises:

about 2.5% by weight of hydrogen peroxide;
about 0.3% by weight of an organic phosphonic acid particularly 1-hydroxyethylidene-1,1-diphosphonic acid;
about 0.35% by weight of lactic acid; and
having a pH from 2 to 3.6; particularly from 2.4 to 3.2.

[0035] In an embodiment, the composition of the invention further comprises one or more additives. In an embodiment, the composition further comprises one or more additives selected from the group consisting of solvents, surfactants, builders, pH adjusting agent, pH buffering agents, thickening/viscosity modifying agent, perfumes or fragrances, preservatives; dyes and other colorants; UV absorbents or antioxidizing agents, fabric softening compositions; static control agents; optical opacifiers, and suds regulants.

[0036] In an embodiment, the composition of the invention comprises one or more solvents. In an embodiment, the composition of the invention comprises one or more miscible organic solvent. In an embodiment, the composition of the invention comprises one or more miscible organic solvent being water-miscible organic solvents. Examples of water-miscibles solvents includes alcohols, ethers, ketones, esters and a mixture thereof. In an embodiment, the composition of the invention comprises one or more water-miscible organic solvents selected from the group consisting of (C_2-C_6) alcohol, (C_1-C_4) alkyl-CO-(C_1-C_4) alkyl, (C_1-C_4) alkyl-O-(C_1-C_4) alkyl, (C_1-C_4) alkyl-CO-O-(C_1-C_4) alkyl and a mixture thereof. If present, the amount of the solvents in the compositions of the present invention is from 2 to 7% by weight; particularly from 3 to 6% by weight.

[0037] In an embodiment, the composition of the invention comprises one or more (C_2-C_6)alcohols. The term "alcohol" refers to an "alkane" wherein at least one hydrogen atom is substituted by a hydroxyl group and which contains the number of carbon atoms specified in the description or claims. The term "alkane" refers to a saturated, branched or linear hydrocarbon which contains the number of carbon atoms specified in the description or claims. Examples include ethanol, *n*-propanol, iso-propanol, butanol, iso-butanol, and sec-butanol. The term "alkyl" refers to a saturated straight, or branched hydrocarbon chain which contains the number of carbon atoms specified in the description or claims. Examples include, among others, the group methyl, ethyl, propyl, isopropyl, butyl, isobutyl, sec-butyl, and tert-butyl. The alkyl group can be optionally substituted. In an embodiment, the solvent is one or more alcohols as defined above. In

en embodiment, the composition of the invention comprises ethanol as alcoholic solvent. In an embodiment, the solvent is one or more ethers of formula (C_1-C_4) alkyl-O-(C_1-C_4). In an embodiment, the composition of the invention comprises one or more ethers as a solvents selected from the group consisting of (3-methoxy-3-methyl-1-butanol) (MMB), di(propylene glycol) n-butyl ether (commercially available with the name Dowanol Dpnb), di(propylene)glycol and a mixture thereof. In an embodiment, the composition comprises di (propylene glycol) n-butyl ether as solvent. In an embodiment, the composition comprises di(propylene)glycol as solvent. In an embodiment, the composition comprises a combination of one or more alcohols as defined above and one or more ethers as defined above. In an embodiment, the composition comprises a mixture of ethanol and di (propylene glycol) n-butyl ether as solvents.

[0038] In an embodiment, the composition of the invention comprises:

from 0.5% to 4% by weight of hydrogen peroxide;
from 0.1% to 0.5% by weight of an organic phosphonic acid, particularly 1-hydroxyethylidene-1,1-diphosphonic acid;
from 0.25% to 0.8% by weight of lactic acid;
from 2 to 7 % by weight of one or more solvents, particularly ethanol, di (propylene glycol) n-butyl ether, di(propylene)glycol and mixture thereof; and
having a pH from 2 to 3.6; particularly from 2.4 to 3.2.

[0039] In an embodiment, the composition of the invention comprises:

from 0.5% to 4% by weight of hydrogen peroxide;
from 0.3% to 1% by weight of an organic phosphonic acid, particularly 1-hydroxyethylidene-1,1-diphosphonic acid;
from 0.2% to 0.8% by weight of lactic acid;
from 3 to 6 % by weight of ethanol; and
having a pH from 2 to 3.6; particularly from 2.4 to 3.2.

[0040] In an embodiment, the composition of the invention comprises:

from 0.5% to 4% by weight of hydrogen peroxide;
from 0.3% to 1% by weight of an organic phosphonic acid, particularly 1-hydroxyethylidene-1,1-diphosphonic acid;
from 0.2% to 0.8% by weight of lactic acid;
from 3 to 6 % by weight of a mixture of ethanol and di (propylene glycol) n-butyl ether; and
having a pH from 2 to 3.6; particularly from 2.4 to 3.2.

[0041] In an embodiment, the composition of the invention comprises:

from 0.5% to 4% by weight of hydrogen peroxide;
from 0.3% to 1% by weight of an organic phosphonic acid, particularly 1-hydroxyethylidene-1,1-diphosphonic acid;
from 0.2% to 0.8% by weight of lactic acid;
from 3 to 6 % by weight of di(propylene)glycol; and
having a pH from 2 to 3.6; particularly from 2.4 to 3.2.

[0042] In an embodiment, the composition of the invention comprises:

from 1% to 3% by weight of hydrogen peroxide;
from 0.2% to 0.35% by weight of an organic phosphonic acid, particularly 1-hydroxyethylidene-1,1-diphosphonic acid;
from 0.3% to 0.75% by weight of lactic acid;
from 2 to 7 % by weight of one or more solvents, particularly ethanol, di (propylene glycol) n-butyl ether, di(propylene)glycol and mixture thereof; and
having a pH from 2 to 3.6; particularly from 2.4 to 3.2.

[0043] In an embodiment, the composition of the invention comprises:

from 1% to 3% by weight of hydrogen peroxide;
from 0.2% to 0.35% by weight of an organic phosphonic acid, particularly 1-hydroxyethylidene-1,1-diphosphonic acid;
from 0.3% to 0.75% by weight of lactic acid;
from 3 to 6 % by weight of one or more solvents, particularly ethanol, di (propylene glycol) n-butyl ether, di(propylene)glycol and mixture thereof; and
having a pH from 2 to 3.6; particularly from 2.4 to 3.2.

[0044] In an embodiment, the composition of the invention comprises:

from 1% to 3% by weight of hydrogen peroxide;
from 0.2% to 0.35% by weight of an organic phosphonic acid, particularly 1-hydroxyethylidene-1,1-diphosphonic acid;
from 0.3% to 0.75% by weight of lactic acid;
from 2 to 7 % by weight of one or more solvents, particularly ethanol, di (propylene glycol) n-butyl ether, di(propylene)glycol and mixture thereof; and
having a pH from 2 to 3.6; particularly from 2.4 to 3.2.

[0045] In an embodiment, the composition of the invention comprises:

from 1% to 3% by weight of hydrogen peroxide;
from 0.2% to 0.35% by weight of an organic phosphonic acid, particularly 1-hydroxyethylidene-1,1-diphosphonic acid;
from 0.3% to 0.75% by weight of lactic acid;
from 3 to 6 % by weight of ethanol; and
having a pH from 2 to 3.6; particularly from 2.4 to 3.2.

[0046] In an embodiment, the composition of the invention comprises:

from 1% to 3% by weight of hydrogen peroxide;
from 0.2% to 0.35% by weight of an organic phosphonic acid, particularly 1-hydroxyethylidene-1,1-diphosphonic acid;
from 0.3% to 0.75% by weight of lactic acid;
from 3 to 6 % by weight of a mixture of ethanol and di (propylene glycol) n-butyl ether; and
and having a pH from 2 to 3.6; particularly from 2.4 to 3.2.

[0047] In an embodiment, the composition of the invention comprises:

from 1% to 3% by weight of hydrogen peroxide;
from 0.2% to 0.35% by weight of an organic phosphonic acid, particularly 1-hydroxyethylidene-1,1-diphosphonic acid;
from 0.3% to 0.75% by weight of lactic acid;
from 3 to 6 % by weight of di(propylene)glycol; and
having a pH from 2 to 3.6; particularly from 2.4 to 3.2.

[0048] In an embodiment, the composition of the invention comprises:

from 1% to 3% by weight of hydrogen peroxide;
from 0.2% to 0.35% by weight of an organic phosphonic acid, particularly 1-hydroxyethylidene-1,1-diphosphonic acid;
from 0.3% to 0.75% by weight of lactic acid;
from 2 to 7 % by weight of one or more solvents, particularly ethanol, di (propylene glycol) n-butyl ether, di(propylene)glycol and mixture thereof; and
having a pH from 2 to 3.6; particularly from 2.4 to 3.2.

[0049] In an embodiment, the composition of the invention comprises:

from 1% to 3% by weight of hydrogen peroxide;
from 0.2% to 0.35% by weight of an organic phosphonic acid, particularly 1-hydroxyethylidene-1,1-diphosphonic acid;
from 0.3% to 0.75% by weight of lactic acid;
from 3 to 6 % by weight of one or more solvents, particularly ethanol, di (propylene glycol) n-butyl ether, di(propylene)glycol and mixture thereof; and
having a pH from 2 to 3.6; particularly from 2.4 to 3.2.

[0050] All the embodiment disclosed in the present invention for the components of the composition (i.e. hydrogen peroxide, organic phophoric acid and lactic acid) as well as the pH value, also applies to the above mentioned composition comprising one or more solvents.

[0051] In an embodiment, the composition of the invention further comprises one or more surfactants as additive. The term "surfactant" refers to a material which lowers the surface tension of a liquid and the interfacial tension between two liquids, allowing their easier spreading. Surfactants have a hydrophilic head that is attracted to water molecules and a hydrophobic tail that repels water and simultaneously attaches itself to oil and grease in dirt. These opposing forces

loosen the dirt and suspend it in the water, having the ability to remove it from surfaces, when surfactants are dissolved in water. If present, the amount of the surfactant in the composition of the present invention is from 0.1-6.5% by weigth of the composition. In an embodiment, the amount of the surfactant in the composition of the present invention is from 0.5% to 5% by weight of the composition. In an embodiment, the amount of the surfactant in the composition of the present invention is from 1% to 4% by weight of the composition. In an embodiment, the amount of the surfactant in the composition of the present invention is from 1% to 3% by weight of the composition. In an embodiment, the amount of the surfactant in the composition of the present invention is from 1.5% to 2% by weight of the composition.

[0052] The surfactant can be divided into three different groups: non-ionic, ionic (either anionic or cationic) or zwitterionic (or amphoteric wherein the head of the surfactant contains two oppositely charged groups) surfactants.

[0053] In an embodiment, the composition of the invention further comprises one or more amphoteric surfactant. As used herein, "amphoteric surfactant" encompasses a surfactant that contains a head with two oppositely charged groups (e.g., positive and negative). Thus, amphoteric surfactants may be anionic (negatively charged), cationic (positively charged) or non-ionic (no charge) in solution, depending on the acidity or pH of the water. In an embodiment, the composition further comprises one or more amphoteric surfactants selected from the group consisting of amine oxides and betaines. Examples of amine oxides appropriate for the present invention include, but without limited to, decyldimethyl-aminoxide, dodecyldimethylamine oxide, tridecyldimethylamine oxide, tetradecyldimethylamine oxide, pentadecyldimethylamine oxide, hexadecyldimethylamine oxide, heptadecyldimethylamine oxide, octadecyldimethylaine oxide, dodecyldipropylamine oxide, tetradecyldipropylamine oxide, hexadecyldipropylamine oxide, tetradecyldibutylamine oxide, octadecyldibutylamine oxide, bis(2-hydroxyethyl)dodecylamine oxide, bis(2-hydroxyethyl)-3-dodecoxy-I-hydroxypropylamine oxide, dimethyl-(2-hydroxydodecyl)amine oxide, 3,6,9-trioctadecyldimethylamine oxide, or 3-dodecoxy-2-hydroxypropyldi-(2- hydroxyethyl)amine oxide. Examples of betaines appropriate for the present invention include, but without limited to, amidobetaines, amidosulfobetaines, coco dimethyl carboxymethyl betaine, cocoamidopropyl betaine, cocobetaine, lauryl amidopropyl betaine, oleyl betaine, lauryl dimethyl carboxymethyl betaine, lauryl dimethyl alphacarboxyethyl betaine, cetyl dimethyl carboxymethyl betaine, lauryl bis-(2-hydroxyethyl)carboxymethyl betaine, stearyl bis-(2-hydroxypropyl)carboxymethyl betaine, oleyl dimethyl gamma-carboxypropyl betaine, lauryl bis-(2-hydroxypropyl)alpha-carboxyethyl betaine, coco dimethyl sulfopropyl betaine, stearyl dimethyl sulfopropyl betaine, lauryl dimethyl sulfoethyl betaine, or lauryl bis-(2-hydroxyethyl)sulfopropyl betaine. In an embodiment, the composition further comprises one or more amphoteric surfactants selected from the group consisting of amine oxides as defined above. In an embodiment, the composition further comprises decyldimethyl-aminoxide. The decyldimethyl-aminoxide is commercially available by the name tegotens® DO. In an embodiment, if present, the amount of amphoteric surfactants is from 0.1 to 2.5% by weight of the composition. In an embodiment, if present, the amount of amphoteric surfactants is from 0.2 to 1.5% by weight of the composition. In an embodiment, if present, the amount of amphoteric surfactants is from 0.3 to 1% by weight of the composition. In an embodiment, if present, the amount of amphoteric surfactants is from 0.4 to 1% by weight of the composition. In an embodiment, if present, the amount of amphoteric surfactants is from 0.4 to 0.6% by weight of the composition.

[0054] In an embodiment, the composition of the invention further comprises one or more non-ionic surfactant. Examples of non-ionic surfactants appropriate for the present invention include, but without limited to, ethoxylated and propoxylated alcohols, especially C_{10-20} alcohols reacted with 2 to 100 moles of ethylene oxide and/or propylene oxide per mole of alcohol, especially ethoxylates of primary alcohols containing about 8 to 18 carbon atoms in a straight or branched chain configuration which have been reacted with about 5 to 30 moles of ethylene oxide, for example, the ethoxylates of decyl alcohol, cetyl alcohol, lauryl alcohol, or myristyl alcohol; ethoxylates of secondary aliphatic alcohols containing 8 to 18 carbon atoms in a straight or branched chain configuration with 5 to 30 moles of ethylene oxide; condensation of aliphatic alcohols containing about 8 to about 20 carbon atoms with ethylene oxide and propylene oxide; polyethylene glycol and polyethylene oxide; ethoxylated castor oil; ethoxylated hydrogenated castor oil; ethoxylated coconut oil; ethoxylated lanolin; ethoxylated tall oil; ethoxylated tallow alcohol; and ethoxylates of sorbitan esters; alkyl polyglycosides, in particular C8/C10 polyglucosides, C8/C10 wheat bran glycoside known by the commercial name Appyclean 6781 of the company Wheat oleo, C12/C14 polyglucosides, polyethoxylated fatty alcohols in particular alcohol C12/C15 with 7 ethoxylated units, C9/C11 with 4 ethoxylated units, C9/C18 with 5 ethoxylated units, ethoxylated fatty acids such as ethoxylated oleic acids, ethoxylated sorbitan esters such as sorbitan laurate with 20 ethoxylated units, ethoxylated triglycerides such as lard, suet, groundnut oil, butter oil, cottonseed oil, flax oil, olive oil, palm oil, grapeseed oil, fish oil, soya oil, castor oil, rape oil, copra oil, coconut oil polyethoxylated, alkylpolyglucosamides, glucamides such as capryloyl/capryl methyl glucamide known by the commercial name GlucoPure Wet, amine oxides such as alkyl oxides C10/C18 dimethylamines, alkoxy oxides C8/C22 ethyldihydroxyethylamines, esters of ethoxylated polyglycerol such as glycereth 17 cocoate, glycereth 7 caprylate caprate, glycereth 20 stearate, ethoxylated amines, ethoxylated fatty amides or copolymers of propylene oxide and ethylene oxides. In an embodiment, the composition of the invention further comprises one or more non-ionic surfactant as defined in the present invention. In an embodiment, the composition of the invention further comprises a non-ionic surfactant selected from the group consisting of C8/C10 wheat bran glycoside, capryloyl/capryl methyl glucamide and a mixture thereof. If present, the amount of non-ionic surfactants in the composition

of the present invention is from 0 % to 4% by weight. In an embodiment, the amount of non-ionic surfactants in the composition of the present invention is from 0.2% to 4% by weight. In an embodiment, the amount of non-ionic surfactants in the composition of the present invention is from 0.5 % to 2% by weight. In an embodiment, the amount of non-ionic surfactants in the composition of the present invention is from 1 % to 2% by weight. In an embodiment, the amount of non-ionic surfactants in the composition of the present invention is from 1.2 % to 1.7% by weight. In an embodiment, the amount of non-ionic surfactants in the composition of the present invention is about 1.5% by weight.

[0055] In an embodiment, the composition of the invention further comprises a non-ionic surfactant being C8/C10 wheat bran glycoside in an amount from 0.2 to 4% by weight of the composition. In an embodiment, the composition of the invention further comprises a non-ionic surfactant being C8/C10 wheat bran glycoside in an amount from 0.5 to 2% by weight of the composition. In an embodiment, the composition of the invention further comprises a non-ionic surfactant being C8/C10 wheat bran glycoside in an amount from 0.8 to 1.5% by weight of the composition. In an embodiment, the composition of the invention further comprises a non-ionic surfactant being C8/C10 wheat bran glycoside in an amount about 1% by weight of the composition.

[0056] In an embodiment, the composition of the invention further comprises a non-ionic surfactant being, capryloyl/capryl methyl glucamide in an amount from 0.2 to 4 % by weight of the composition. In an embodiment, the composition of the invention further comprises a non-ionic surfactant being, capryloyl/capryl methyl glucamide in an amount from 0.3 to 2 % by weight of the composition. In an embodiment, the composition of the invention further comprises a non-ionic surfactant being, capryloyl/capryl methyl glucamide in an amount from 0.4 to 1.5 % by weight of the composition. In an embodiment, the composition of the invention further comprises a non-ionic surfactant being, capryloyl/capryl methyl glucamide in an amount from 0.5 to 0.8 % by weight of the composition. In an embodiment, the composition of the invention further comprises a non-ionic surfactant being, capryloyl/capryl methyl glucamide in an amount fabout 0.5 % by weight of the composition.

[0057] In an embodiment, the composition of the invention further comprises one or more amphoteric surfactants and one or more non-ionic surfactant as defined in the present invention. In an embodiment, the composition of the invention further comprises decyldimethyl-aminoxide (commercially available by the name tegotens® DO) as amphoteric surfactant and a C8/C10 wheat bran glycoside, capryloyl/capryl methyl glucamide or a mixture thereof as non-ionic surfactants.

[0058] In an embodiment, the composition of the invention comprises:

from 0.5% to 4% by weight of hydrogen peroxide; from 0.1% to 0.5% by weight of an organic phosphonic acid, particularly 1-hydroxyethylidene-1,1-diphosphonic acid;
from 0.25% to 0.8% by weight of lactic acid;
from 0.1% to 6.5% by weigt of surfactants; and
having a pH from 2 to 3.6; particularly from 2.4 to 3.2.

[0059] In an embodiment, the composition of the invention comprises:

from 0.5% to 4% by weight of hydrogen peroxide;
from 0.1% to 0.5% by weight of an organic phosphonic acid, particularly 1-hydroxyethylidene-1,1-diphosphonic acid;
from 0.25% to 0.8% by weight of lactic acid;
from 0.1% to 2.5% by weigt of amphoteric surfactants as defined above; particularly decyldimethyl-aminoxide;
from 0.2% to 4% by weigt of non-ionic surfactants as defined above; particularly C8/C10 wheat bran glycoside, capryloyl/capryl methyl glucamide or a mixture thereof; and
having a pH from 2 to 3.6; particularly from 2.4 to 3.2.

[0060] In an embodiment, the composition of the invention comprises:

from 0.5% to 4% by weight of hydrogen peroxide;
from 0.1% to 0.5% by weight of an organic phosphonic acid, particularly 1-hydroxyethylidene-1,1-diphosphonic acid;
from 0.25% to 0.8% by weight of lactic acid;
from 0.2% to 4% by weigt of amphoteric surfactants as defined above; particularly decyldimethyl-aminoxide; and
having a pH from 2 to 3.6; particularly from 2.4 to 3.2.

[0061] In an embodiment, the composition of the invention comprises:

from 0.5% to 4% by weight of hydrogen peroxide;
from 0.3% to 0.5% by weight of an organic phosphonic acid, particularly 1-hydroxyethylidene-1,1-diphosphonic acid;
from 0.25% to 0.8% by weight of lactic acid;
from 0.2% to 4% by weigt of non-ionic surfactants as defined above; particularly C8/C10 wheat bran glycoside,

capryloyl/capryl methyl glucamide or a mixture thereof; and
having a pH from 2 to 3.6; particularly from 2.4 to 3.2.

[0062] In an embodiment, the composition of the invention comprises:

from 0.5% to 4% by weight of hydrogen peroxide;
from 0.3% to 0.5% by weight of an organic phosphonic acid, particularly 1-hydroxyethylidene-1,1-diphosphonic acid;
from 0.25% to 0.8% by weight of lactic acid;
from 0.1% to 6.5% by weigt of surfactants;
from 3 to 7% by weight of one or more solvents, particularly ethanol, di (propylene glycol) n-butyl ether and di(propylene)glycol and mixture thereof; and
having a pH from 2 to 3.6; particularly from 2.4 to 3.2.

[0063] In an embodiment, the composition of the invention comprises:

from 0.5% to 4% by weight of hydrogen peroxide;
from 0.3% to 0.5% by weight of an organic phosphonic acid, particularly 1-hydroxyethylidene-1,1-diphosphonic acid;
from 0.25% to 0.8% by weight of lactic acid;
from 3 to 7 % by weight of one or more solvents, particularly ethanol, di (propylene glycol) n-butyl ether and di(propylene)glycol and mixture thereof;
from 0.1% to 2.5% by weigt of amphoteric surfactants as defined above; particularly decyldimethyl-aminoxide;
from 0.2% to 4% by weigt of non-ionic surfactants as defined above; particularly C8/C10 wheat bran glycoside, capryloyl/capryl methyl glucamide or a mixture thereof; and
having a pH from 2 to 3.6; particularly from 2.4 to 3.2.

[0064] In an embodiment, the composition of the invention comprises:

from 0.5% to 4% by weight of hydrogen peroxide;
from 0.3% to 0.5% by weight of an organic phosphonic acid, particularly 1-hydroxyethylidene-1,1-diphosphonic acid;
from 0.25% to 0.8% by weight of lactic acid;
from 3 to 7 % by weight of one or more solvents, particularly ethanol, di (propylene glycol) n-butyl ether and di(propylene)glycol and mixture thereof;
from 0.2% to 4% by weigt of amphoteric surfactants as defined above; particularly decyldimethyl-aminoxide; and
having a pH from 2 to 3.6; particularly from 2.4 to 3.2.

[0065] In an embodiment, the composition of the invention comprises:

from 0.5% to 4% by weight of hydrogen peroxide;
from 0.3% to 0.5% by weight of an organic phosphonic acid, particularly 1-hydroxyethylidene-1,1-diphosphonic acid;
from 0.25% to 0.8% by weight of lactic acid;
from 3 to 7 % by weight of one or more solvents, particularly ethanol, di (propylene glycol) n-butyl ether and di(propylene)glycol and mixture thereof;
from 0.2% to 4% by weigt of non-ionic surfactants as defined above; particularly C8/C10 wheat bran glycoside, capryloyl/capryl methyl glucamide or a mixture thereof; and
having a pH from 2 to 3.6; particularly from 2.4 to 3.2.

[0066] In an embodiment, the composition of the invention comprises:

from 1% to 3% by weight of hydrogen peroxide;
from 0.2% to 0.35% by weight of an organic phosphonic acid, particularly 1-hydroxyethylidene-1,1-diphosphonic acid;
from 0.3% to 0.75% by weight of lactic acid;
from 0.1% to 6.5% by weigt of surfactants; and
having a pH from 2 to 3.6; particularly from 2.4 to 3.2.

[0067] In an embodiment, the composition of the invention comprises:

from 1% to 3% by weight of hydrogen peroxide;
from 0.2% to 0.35% by weight of an organic phosphonic acid, particularly 1-hydroxyethylidene-1,1-diphosphonic acid;

from 0.3% to 0.75% by weight of lactic acid;
from 0.1% to 2.5% by weigt of amphoteric surfactants as defined above; particularly decyldimethyl-aminoxide;
from 0.2% to 4% by weigt of non-ionic surfactants as defined above; particularly C8/C10 wheat bran glycoside, capryloyl/capryl methyl glucamide or a mixture thereof; and
having a pH from 2 to 3.6; particularly from 2.4 to 3.2.

[0068] In an embodiment, the composition of the invention comprises:

from 1% to 3% by weight of hydrogen peroxide;
from 0.2% to 0.35% by weight of an organic phosphonic acid, particularly 1-hydroxyethylidene-1,1-diphosphonic acid;
from 0.3% to 0.75% by weight of lactic acid;
from 0.2% to 4% by weigt of amphoteric surfactants as defined above; particularly decyldimethyl-aminoxide; and
having a pH from 2 to 3.6; particularly from 2.4 to 3.2.

[0069] In an embodiment, the composition of the invention comprises:

from 1% to 3% by weight of hydrogen peroxide;
from 0.2% to 0.35% by weight of an organic phosphonic acid, particularly 1-hydroxyethylidene-1,1-diphosphonic acid;
from 0.3% to 0.75% by weight of lactic acid;
from 0.2% to 4% by weigt of non-ionic surfactants as defined above; particularly C8/C10 wheat bran glycoside, capryloyl/capryl methyl glucamide or a mixture thereof; and
having a pH from 2 to 3.6; particularly from 2.4 to 3.2.

[0070] In an embodiment, the composition of the invention comprises:

from 1% to 3% by weight of hydrogen peroxide;
from 0.2% to 0.35% by weight of an organic phosphonic acid, particularly 1-hydroxyethylidene-1,1-diphosphonic acid;
from 0.3% to 0.75% by weight of lactic acid;
from 0.1% to 6.5% by weigt of surfactants;
from 3 to 7 % by weight of one or more solvents, particularly ethanol, di (propylene glycol) n-butyl ether and di(propylene)glycol and mixture thereof; and
having a pH from 2 to 3.6; particularly from 2.4 to 3.2.

[0071] In an embodiment, the composition of the invention comprises:

from 1% to 3% by weight of hydrogen peroxide;
from 0.2% to 0.35% by weight of an organic phosphonic acid, particularly 1-hydroxyethylidene-1,1-diphosphonic acid;
from 0.3% to 0.75% by weight of lactic acid;
from 3 to 7 % by weight of one or more solvents, particularly ethanol, di (propylene glycol) n-butyl ether and di(propylene)glycol and mixture thereof;
from 0.1% to 2.5% by weigt of amphoteric surfactants as defined above; particularly decyldimethyl-aminoxide;
from 0.2% to 4% by weigt of non-ionic surfactants as defined above; particularly C8/C10 wheat bran glycoside, capryloyl/capryl methyl glucamide or a mixture thereof; and
having a pH from 2 to 3.6; particularly from 2.4 to 3.2.

[0072] In an embodiment, the composition of the invention comprises:

from 1% to 3% by weight of hydrogen peroxide;
from 0.2% to 0.35% by weight of an organic phosphonic acid, particularly 1-hydroxyethylidene-1,1-diphosphonic acid;
from 0.3% to 0.75% by weight of lactic acid;
from 3 to 7 % by weight of one or more solvents, particularly ethanol, di (propylene glycol) n-butyl ether and di(propylene)glycol and mixture thereof;
from 0.2% to 4% by weigt of amphoteric surfactants as defined above; particularly decyldimethyl-aminoxide; and
having a pH from 2 to 3.6; particularly from 2.4 to 3.2.

[0073] In an embodiment, the composition of the invention comprises:

from 1% to 3% by weight of hydrogen peroxide;

from 0.2% to 0.35% by weight of an organic phosphonic acid, particularly 1-hydroxyethylidene-1,1-diphosphonic acid;
from 0.3% to 0.75% by weight of lactic acid;
from 3 to 7 % by weight of one or more solvents, particularly ethanol, di (propylene glycol) n-butyl ether and di(propylene)glycol and mixture thereof;
from 0.2% to 4% by weigt of non-ionic surfactants as defined above; particularly C8/C10 wheat bran glycoside, capryloyl/capryl methyl glucamide or a mixture thereof; and
having a pH from 2 to 3.6; particularly from 2.4 to 3.2.

[0074] All the embodiment disclosed in the present invention for the components of the composition (i.e. hydrogen peroxide, organic phophoric acid, lactic acid and solvents) as well as the pH value also applies to the above mentioned composition comprising surfactants.

[0075] In an embodiment, the composition of the invention further comprises one or more builders. The builder is commonly used for stabilizing the composition. The term "builder" encompasses chelating agents (chelators), sequestering agents (sequestrants), detergent builders, water soluble salts thereof and a mixture thereof. For the purpose of the invention, the term "water soluble builder salts" encompasses inorganic alkaline builder salts which may be used alone or in admixture with other builders, but are not limited to, alkali metal or ammonia or substituted ammonium salts of carbonates, silicates, phosphates and polyphosphates, and borates. Water soluble organic alkaline builders which are useful in the present invention include alkanolamines and cyclic amines. Examples of appropriate builders for the present invention include, but without limited to, phosphonic acids and phosphonates, phosphates, amino carboxylates and their derivatives including salts of hydroxy ethylenediaminetetraacetic acid (HEDTA), and diethylenetriaminepentaacetic acid, and glutamic acid, N,N-diacetic acid tetrasodium salt (commercially available as Dissolvine GL-47®); pyrophosphates, polyphosphates, ethylenediamine and ethylenediamine derivatives, hydroxy acids, and mono-, di-, and tri-carboxylates and their corresponding acids, aluminosilicates, nitroloacetates and their derivatives, and mixtures thereof. Examples of organic chelating include polyanionic compositions such as polyacrylic acid compounds, N-hydroxyethylenediaminetriacetic acid (HEDTA), ethylenediaminetetraacetic acid (EDTA), nitrilotriaacetic acid (NTA), diethylenetriaminepentaacetic acid (DTPA), ethylenediaminetetraproprionic acid triethylenetetraaminehexaacetic acid (TTHA), and the respective alkali metal, ammonium and substituted ammonium salts thereof; amino phosphonates including ethylenediaminetetramethylene phosphonates, nitrilotrismethylene phosphonates, and diethylenetriamine-(pentamethylene phosphonate) for example. Other suitable sequestrant agents include water soluble polycarboxylate polymers. Such homopolymeric and copolymeric chelating agents include polymeric compositions with pendant ($-CO_2H$) carboxylic acid groups and include polyacrylic acid, polymethacrylic acid, polymaleic acid, acrylic acid-methacrylic acid copolymers, acrylic-maleic copolymers, hydrolyzed polyacrylamide, hydrolyzed methacrylamide, hydrolyzed acrylamide-methacrylamide copolymers, hydrolyzed polyacrylonitrile, hydrolyzed polymethacrylonitrile, hydrolyzed acrylonitrile methacrylonitrile copolymers, or mixtures thereof Water soluble salts or partial salts of these polymers or copolymers such as their respective alkali metal (for example, sodium or potassium) or ammonium salts may also be used. Examples of commercially available biodegradable aminocarboxylate or derivative thereof are Dissolvine GL-38® and Dissolvine GL-47® both available from Akzo; Trilon M® available from BASF; Baypure CX100® available from Bayer; Versene EDG® available from Dow; HIDS® available from Nippon Shakubai; Octaquest E30® and Octaquest A65® both available from Finetex/Innospec Octel. In an embodiment, the one or more builders are amino carboxylates and their derivatives as defined in the present invention. In an embodiment, the composition further comprises one or more aminocarboxylate builders selected from the group consisting of methyl glycine N,N-diacetic acid trisodium salt (MGDA-commercially available as Dissolvine M-40®) and glutamic acid, N,N-diacetic acid tetrasodium salt (commercially available as Dissolvine GL-38®). In an embodiment, the composition further comprises glutamic acid, N,N-diacetic acid tetrasodium salt (commercially available as Dissolvine GL-38®) as builder. If present, the amount of builders in the composition of the present invention is from 0.04 to 1% by weight. In particular, the amount of aminocarboxylate builders, particularly N,N-diacetic acid tetrasodium salt (commercially available as Dissolvine GL-38®), in the composition of the present invention is from 0.04 to 0.1% by weight.

[0076] In an embodiment, the composition of the invention comprises:

from 0.5% to 4% by weight of hydrogen peroxide;
from 0.1% to 0.5% by weight of an organic phosphonic acid, particularly 1-hydroxyethylidene-1,1-diphosphonic acid;
from 0.25% to 0.8% by weight of lactic acid;
from 0.04 to 1% by weight of one or more builders, particularly aminocarboxylate builder such as glutamic acid, N,N-diacetic acid tetrasodium salt; and
having a pH from 2 to 3.6; particularly from 2.4 to 3.2.

[0077] In an embodiment, the composition of the invention comprises:

from 0.5% to 4% by weight of hydrogen peroxide;
from 0.1% to 0.5% by weight of an organic phosphonic acid, particularly 1-hydroxyethylidene-1,1-diphosphonic acid;
from 0.25% to 0.8% by weight of lactic acid;
from 0.04 to 1% by weight of one or more builders, particularly aminocarboxylate builder such as glutamic acid, N,N-diacetic acid tetrasodium salt;
from 3 to 7 % by weight of one or more solvents, particularly ethanol, di (propylene glycol) n-butyl ether and di(propylene)glycol and mixture thereof; and
having a pH from 2 to 3.6; particularly from 2.4 to 3.2.

[0078] In an embodiment, the composition of the invention comprises:

from 0.5% to 4% by weight of hydrogen peroxide;
from 0.1% to 0.5% by weight of an organic phosphonic acid, particularly 1-hydroxyethylidene-1,1-diphosphonic acid;
from 0.25% to 0.8% by weight of lactic acid;
from 0.1% to 6.5% by weigt of surfactants;
from 0.04 to 1% by weight of one or more builders, particularly aminocarboxylate builder such as glutamic acid, N,N-diacetic acid tetrasodium salt; and
having a pH from 2 to 3.6; particularly from 2.4 to 3.2.

[0079] In an embodiment, the composition of the invention comprises:

from 0.5% to 4% by weight of hydrogen peroxide;
from 0.1% to 0.5% by weight of an organic phosphonic acid, particularly 1-hydroxyethylidene-1,1-diphosphonic acid;
from 0.25% to 0.8% by weight of lactic acid;
from 0.1% to 2.5% by weigt of amphoteric surfactants as defined above; particularly decyldimethyl-aminoxide;
from 0.2% to 4% by weigt of non-ionic surfactants as defined above; particularly C8/C10 wheat bran glycoside, capryloyl/capryl methyl glucamide or a mixture thereof;
from 0.04 to 1% by weight of one or more builders, particularly aminocarboxylate builder such as glutamic acid, N,N-diacetic acid tetrasodium salt; and
having a pH from 2 to 3.6; particularly from 2.4 to 3.2.

[0080] In an embodiment, the composition of the invention comprises:

from 0.5% to 4% by weight of hydrogen peroxide;
from 0.1% to 0.5% by weight of an organic phosphonic acid, particularly 1-hydroxyethylidene-1,1-diphosphonic acid;
from 0.25% to 0.8% by weight of lactic acid;
from 0.1% to 2.5% by weigt of amphoteric surfactants as defined above; particularly decyldimethyl-aminoxide;
from 0.04 to 1% by weight of one or more builders, particularly aminocarboxylate builder such as glutamic acid, N,N-diacetic acid tetrasodium salt; and
having a pH from 2 to 3.6; particularly from 2.4 to 3.2.

[0081] In an embodiment, the composition of the invention comprises:

from 0.5% to 4% by weight of hydrogen peroxide;
from 0.1% to 0.5% by weight of an organic phosphonic acid, particularly 1-hydroxyethylidene-1,1-diphosphonic acid;
from 0.25% to 0.8% by weight of lactic acid;
from 0.2% to 4% by weigt of non-ionic surfactants as defined above; particularly C8/C10 wheat bran glycoside, capryloyl/capryl methyl glucamide or a mixture thereof;
from 0.04 to 1% by weight of one or more builders, particularly aminocarboxylate builder such as glutamic acid, N,N-diacetic acid tetrasodium salt; and
having a pH from 2 to 3.6; particularly from 2.4 to 3.2.

[0082] In an embodiment, the composition of the invention comprises:

from 0.5% to 4% by weight of hydrogen peroxide;
from 0.1% to 0.5% by weight of an organic phosphonic acid, particularly 1-hydroxyethylidene-1,1-diphosphonic acid;
from 0.25% to 0.8% by weight of lactic acid;
from 0.1% to 6.5% by weigt of surfactants;

from 3% to 7 % by weight of one or more solvents, particularly ethanol, di (propylene glycol) n-butyl ether and di(propylene)glycol and mixture thereof;
from 0.04 to 1% by weight of one or more builders, particularly aminocarboxylate builder such as glutamic acid, N,N-diacetic acid tetrasodium salt; and
having a pH from 2 to 3.6; particularly from 2.4 to 3.2.

[0083] In an embodiment, the composition of the invention comprises:

from 0.5% to 4% by weight of hydrogen peroxide;
from 0.1% to 0.5% by weight of an organic phosphonic acid, particularly 1-hydroxyethylidene-1,1-diphosphonic acid;
from 0.25% to 0.8% by weight of lactic acid;
from 0.1% to 2.5% by weigt of amphoteric surfactants as defined above; particularly decyldimethyl-aminoxide;
from 0.2% to 4% by weigt of non-ionic surfactants as defined above; particularly C8/C10 wheat bran glycoside, capryloyl/capryl methyl glucamide or a mixture thereof;
from 3% to 7 % by weight of one or more solvents, particularly ethanol, di (propylene glycol) n-butyl ether and di(propylene)glycol and mixture thereof;
from 0.04 to 1% by weight of one or more builders, particularly aminocarboxylate builder such as glutamic acid, N,N-diacetic acid tetrasodium salt; and
having a pH from 2 to 3.6; particularly from 2.4 to 3.2.

[0084] In an embodiment, the composition of the invention comprises:

from 0.5% to 4% by weight of hydrogen peroxide;
from 0.1% to 0.5% by weight of an organic phosphonic acid, particularly 1-hydroxyethylidene-1,1-diphosphonic acid;
from 0.25% to 0.8% by weight of lactic acid;
from 0.1% to 2.5% by weigt of amphoteric surfactants as defined above; particularly decyldimethyl-aminoxide;
from 3% to 7 % by weight of one or more solvents, particularly ethanol, di (propylene glycol) n-butyl ether and di(propylene)glycol and mixture thereof;
from 0.04 to 1% by weight of one or more builders, particularly aminocarboxylate builder such as glutamic acid, N,N-diacetic acid tetrasodium salt; and
having a pH from 2 to 3.6; particularly from 2.4 to 3.2.

[0085] In an embodiment, the composition of the invention comprises:

from 0.5% to 4% by weight of hydrogen peroxide;
from 0.1% to 0.5% by weight of an organic phosphonic acid, particularly 1-hydroxyethylidene-1,1-diphosphonic acid;
from 0.25% to 0.8% by weight of lactic acid;
from 0.1% to 2.5% by weigt of amphoteric surfactants as defined above; particularly decyldimethyl-aminoxide;
from 3 to 7 % by weight of one or more solvents, particularly ethanol, di (propylene glycol) n-butyl ether and di(propylene)glycol and mixture thereof;
from 0.04 to 1% by weight of one or more builders, particularly aminocarboxylate builder such as glutamic acid, N,N-diacetic acid tetrasodium salt; and
having a pH from 2 to 3.6; particularly from 2.4 to 3.2.

[0086] In an embodiment, the composition of the invention comprises:

from 1% to 3% by weight of hydrogen peroxide;
from 0.2% to 0.35% by weight of an organic phosphonic acid, particularly 1-hydroxyethylidene-1,1-diphosphonic acid;
from 0.3% to 0.75% by weight of lactic acid;
from 0.04 to 1% by weight of one or more builders, particularly aminocarboxylate builder such as glutamic acid, N,N-diacetic acid tetrasodium salt; and
having a pH from 2 to 3.6; particularly from 2.4 to 3.2.

[0087] In an embodiment, the composition of the invention comprises:

from 1% to 3% by weight of hydrogen peroxide;
from 0.2% to 0.35% by weight of an organic phosphonic acid, particularly 1-hydroxyethylidene-1,1-diphosphonic acid;
from 0.3% to 0.75% by weight of lactic acid;

from 0.04 to 1% by weight of one or more builders, particularly aminocarboxylate builder such as glutamic acid, N,N-diacetic acid tetrasodium salt;
from 3 to 7 % by weight of one or more solvents, particularly ethanol, di (propylene glycol) n-butyl ether and di(propylene)glycol and mixture thereof; and
having a pH from 2 to 3.6; particularly from 2.4 to 3.2.

[0088] In an embodiment, the composition of the invention comprises:

from 1% to 3% by weight of hydrogen peroxide;
from 0.2% to 0.35% by weight of an organic phosphonic acid, particularly 1-hydroxyethylidene-1,1-diphosphonic acid;
from 0.3% to 0.75% by weight of lactic acid;
from 0.1% to 6.5% by weigt of surfactants;
from 0.04 to 1% by weight of one or more builders, particularly aminocarboxylate builder such as glutamic acid, N,N-diacetic acid tetrasodium salt; and
having a pH from 2 to 3.6; particularly from 2.4 to 3.2.

[0089] In an embodiment, the composition of the invention comprises:

from 1% to 3% by weight of hydrogen peroxide;
from 0.2% to 0.35% by weight of an organic phosphonic acid, particularly 1-hydroxyethylidene-1,1-diphosphonic acid;
from 0.3% to 0.75% by weight of lactic acid;
from 0.1% to 2.5% by weigt of amphoteric surfactants as defined above; particularly decyldimethyl-aminoxide;
from 0.2% to 4% by weigt of non-ionic surfactants as defined above; particularly C8/C10 wheat bran glycoside, capryloyl/capryl methyl glucamide or a mixture thereof;
from 0.04 to 1% by weight of one or more builders, particularly aminocarboxylate builder such as glutamic acid, N,N-diacetic acid tetrasodium salt; and
having a pH from 2 to 3.6; particularly from 2.4 to 3.2.

[0090] In an embodiment, the composition of the invention comprises:

from 1% to 3% by weight of hydrogen peroxide;
from 0.2% to 0.35% by weight of an organic phosphonic acid, particularly 1-hydroxyethylidene-1,1-diphosphonic acid;
from 0.3% to 0.75% by weight of lactic acid;
from 0.1% to 2.5% by weigt of amphoteric surfactants as defined above; particularly decyldimethyl-aminoxide;
from 0.04 to 1% by weight of one or more builders, particularly aminocarboxylate builder such as glutamic acid, N,N-diacetic acid tetrasodium salt; and
having a pH from 2 to 3.6; particularly from 2.4 to 3.2.

[0091] In an embodiment, the composition of the invention comprises:

from 1% to 3% by weight of hydrogen peroxide;
from 0.2% to 0.35% by weight of an organic phosphonic acid, particularly 1-hydroxyethylidene-1,1-diphosphonic acid;
from 0.3% to 0.75% by weight of lactic acid;
from 0.2% to 4% by weigt of non-ionic surfactants as defined above; particularly C8/C10 wheat bran glycoside, capryloyl/capryl methyl glucamide or a mixture thereof;
from 0.04 to 1% by weight of one or more builders, particularly aminocarboxylate builder such as glutamic acid, N,N-diacetic acid tetrasodium salt; and
having a pH from 2 to 3.6; particularly from 2.4 to 3.2.

[0092] In an embodiment, the composition of the invention comprises:

from 1% to 3% by weight of hydrogen peroxide;
from 0.2% to 0.35% by weight of an organic phosphonic acid, particularly 1-hydroxyethylidene-1,1-diphosphonic acid;
from 0.3% to 0.75% by weight of lactic acid;
from 0.1% to 6.5% by weigt of surfactants;
from 3% to 7 % by weight of one or more solvents, particularly ethanol, di (propylene glycol) n-butyl ether and di(propylene)glycol and mixture thereof;
from 0.04 to 1% by weight of one or more builders, particularly aminocarboxylate builder such as glutamic acid,

N,N-diacetic acid tetrasodium salt; and
having a pH from 2 to 3.6; particularly from 2.4 to 3.2.

[0093] In an embodiment, the composition of the invention comprises:

from 1% to 3% by weight of hydrogen peroxide;
from 0.2% to 0.35% by weight of an organic phosphonic acid, particularly 1-hydroxyethylidene-1,1-diphosphonic acid;
from 0.3% to 0.75% by weight of lactic acid;
from 0.1% to 2.5% by weigt of amphoteric surfactants as defined above; particularly decyldimethyl-aminoxide;
from 0.2% to 4% by weigt of non-ionic surfactants as defined above; particularly C8/C10 wheat bran glycoside, capryloyl/capryl methyl glucamide or a mixture thereof;
from 3% to 7 % by weight of one or more solvents, particularly ethanol, di (propylene glycol) n-butyl ether and di(propylene)glycol and mixture thereof;
from 0.04 to 1% by weight of one or more builders, particularly aminocarboxylate builder such as glutamic acid, N,N-diacetic acid tetrasodium salt; and
having a pH from 2 to 3.6; particularly from 2.4 to 3.2.

[0094] In an embodiment, the composition of the invention comprises:

from 1% to 3% by weight of hydrogen peroxide;
from 0.2% to 0.35% by weight of an organic phosphonic acid, particularly 1-hydroxyethylidene-1,1-diphosphonic acid;
from 0.3% to 0.75% by weight of lactic acid;
from 0.1% to 2.5% by weigt of amphoteric surfactants as defined above; particularly decyldimethyl-aminoxide;
from 3% to 7 % by weight of one or more solvents, particularly ethanol, di (propylene glycol) n-butyl ether and di(propylene)glycol and mixture thereof;
from 0.04 to 1% by weight of one or more builders, particularly aminocarboxylate builder such as glutamic acid, N,N-diacetic acid tetrasodium salt; and
having a pH from 2 to 3.6; particularly from 2.4 to 3.2.

[0095] In an embodiment, the composition of the invention comprises:

from 1% to 3% by weight of hydrogen peroxide;
from 0.2% to 0.35% by weight of an organic phosphonic acid, particularly 1-hydroxyethylidene-1,1-diphosphonic acid;
from 0.3% to 0.75% by weight of lactic acid;
from 0.1% to 2.5% by weigt of amphoteric surfactants as defined above; particularly decyldimethyl-aminoxide;
from 3 to 7 % by weight of one or more solvents, particularly ethanol, di (propylene glycol) n-butyl ether and di(propylene)glycol and mixture thereof;
from 0.04 to 1% by weight of one or more builders, particularly aminocarboxylate builder such as glutamic acid, N,N-diacetic acid tetrasodium salt; and
having a pH from 2 to 3.6; particularly from 2.4 to 3.2.

[0096] In an embodiment, the composition of the invention comprises:

from 0.5% to 4% by weight of hydrogen peroxide;
from 0.1% to 0.5% by weight of an organic phosphonic acid;
from 0.25% to 0.8% by weight of lactic acid;
from 0.1 to 6.5% by weight of surfactats;
from 3 to 7% by weight of solvents; and
from 0 to 1% by weight of builders;
being the sum of all the components up to 100% by weight; and
having a pH from 2 to 3.6.

[0097] In an embodiment, the composition of the invention comprises:

from 0.5% to 4% by weight of hydrogen peroxide;
from 0.1% to 0.5% by weight of 1-hydroxyethylidene-1,1-diphosphonic acid (HEDP);
from 0.25% to 0.8% by weight of lactic acid;
from 0.1 to 2.5 % by weight of decyldimethyl-aminoxide;

from 0.2 to 4 % by weight of C8/C10 wheat bran glycoside;
from 0 to 4 % by weight of capryloyl/capryl methyl glucamide;
from 3 to 7 % by weight of ethanol
from 0 to 1% by weight of glutamic acid, N,N-diacetic acid tetrasodium salt;
sufficient amount up to 100% by weight of water;
being the sum of all the components up to 100% by weight; and
having a pH from 2 to 3.6.

[0098] All the embodiment disclosed in the present invention for the components of the composition (i.e. hydrogen peroxide, organic phophoric acid, lactic acid, solvents, surfactants) as well as the pH value, also applies to the above mentioned composition comprising builders.

[0099] Other conventional additives can be also included to the composition of the present invention, provided each ingredient is compatible with the other ingredients of the composition and the presence of the ingredient does not adversely affect the stability and the properties of the composition. Each additional ingredient may be used to modify the composition of the present invention in a conventional way and may be present in an effective amount, that is, in the amount required to achieve the desired disinfecatnt and cleaning effect without adversely affecting its stability, toxicity and material compatibility. Examples of conventional additives are selected from the group consisting of thickening/viscosity modifying agent, perfumes or fragrances, preservatives; dyes and other colorants; UV absorbents or antioxidizing agents, fabric softening compositions; static control agents; optical opacifiers, such as polystyrene particles; and suds regulants, such as dimethylpolysiloxane. The appropriate additional conventional additives as defined above and their amounts, can readily be determined by those skilled in the art according to the type of formulation being prepared.

[0100] As it is disclosed above, the composition of the present invention has a pH from 2 to 3.6. In en embodiment, the composition has a pH from 2 to 3.5. In en embodiment, the composition has a pH from 2.4 to 3.5. In en embodiment, the composition has a pH from 2.4 to 3.2. In en embodiment, the composition has a pH from 2.8 to 3.2. The pH is measured using the methods known in the state of the art. In the present invention, the pH is measured according to the CIPAC guideline MT75.3. This pH is the appropriate for having a stable, non-toxic and an efficient disinfectant and cleaning properties.

[0101] In an embodiment, the composition further comprises one or more pH adjusting agents. The terms "pH adjusting" or "pH regulator" agent have the same meaning and are used interchangeable. They refer to acids or bases that can be used to adjust the pH of the finished composition to the desired level, without affecting the stability of the composition and its disinfectant and cleaning properties. The acid(s) and/or base(s) may be added to the composition in any suitable form, such as anhydrous, hydrated, aqueous or salt. In an embodiment, the pH adjusting agent is a base. Examples of appropriate bases include alkali metal and alkaline earth metal hydroxides, ammonium hydroxide, substituted ammonium hydroxides (such as primary, secondary, tertiary, or quaternary ammonium hydroxides), and mixtures thereof. In an embodiment, the pH adjusting agent is an acid. Examples of appropriate acids include sulfur-containing acid, such as a sulfonic acid, sulfuric acid, an alkali metal bisulfate, phosphoric acid and nitric acid. If present, the amount of the pH adjusting agent in the composition of the present invention is such for having the appropriate pH value of the compositions of the present invention.

[0102] In an embodiment, the composition further comprises one or more pH buffering agents. The term "pH buffering" agent is an acid in a sufficient amonut that control the pH into the desired acidic pH range of the composition as defined above. The presence of one or more pH buffering agent allows minimizing the pH changes, particularly after dilution. Examples of appropriate pH buffering agent include weak inorganic acids of phosphoric acid, strong organic acids of sulfonic acids, weak organic acids of phosphoric acid, phosphonic acid, boronic acid and mono- or multi-carboxylic acid (such as acetic acid, citric acid). If present, the amount of the pH buffering agent in the composition of the present invention is from 0.25 to 0.50 % by weight.

[0103] The composition of the first aspect of the invention may be packaged and used to treat a given surface in any suitable format known to one of ordinary skill in the art, such as liquid compositions, foam composition, gel composition or impregnated on solid surfaces (such as wipes). In an embodiment, the composition of the invention is in liquid format. In particular, the liquid format is a water-based solution composition which can be in form of spray, aerosol, bottle, doypack and sachet. The liquid compositions of the present invention may be packaged in manually operated dispensing containers (such as a trigger or a pump dispenser). In such a dispenser, the liquid composition may be divided in fine liquid droplets resulting in a spray/aerosol that is directed onto the surface to be treated. In an embodiment, the composition of the invention is in gel format. When the composition is a gel, the composition further comprises one or more jellifying agents. The appropriate jellifying agents and their amounts, can readily be determined by those skilled in the art according to the type of formulation being prepared. Examples of appropriate jellifying agents include, acrylates/palmeth-25 acrylate copolymer (POLYGEL W301), 2-propenoic acid, homopolymer (POLYGEL CA) and a mixture thereof. The gel compositions of the present invention may be packaged in manually operated dispensing containers, bottle, doypack and sachet. In an embodiment, the composition of the invention is in foam format. When the composition is a foam, the

composition further comprises one or more foaming agents. The appropriate foaming agents and their amounts, can readily be determined by those skilled in the art according to the type of formulation being prepared. Examples of appropriate foaming agents include any of the surfactants as defined above in the present invention. The foam compositions of the present invention may be packaged in manually operated dispensing containers. In an embodiment, the composition of the invention is in wipes format such as disposable towels incorporated/impregnated/wetted with the composition of the first aspect of the invention.

[0104] The second aspect of the invention relates to a process for the preparation of the composition of the first aspect of the invention.

[0105] The compositions of the present invention can be prepared according to methods well known in the state of the art according to the type of formulation being prepared.

[0106] In an embodiment, the process for the preparation of the composition of the first aspect of the invention comprises:

Step a) providing an aqueous mixture of the organic phosphonic acid and, if present, the additives (such as surfactants, solvents and builders);
Step b) adding the hydrogen peroxide and the lactic acid simutaneously or sequentially to the resulting aqueous mixture obtained in step a) until having a composition having a pH from 2 to 3.6; and
optionally step c) adjusting the volume of the mixture obtained in step b) by adding the appropriate amount of water.

[0107] In an embodiment, the process for the preparation of the composition of the first aspect of the invention comprises:

Step a) providing an aqueous mixture of the organic phosphonic acid and, if present, the additives except from fragrance (such as surfactants, solvents and builders);
Step a') adding the fragrance to the resulting mixture of step a); and
Step b) adding the hydrogen peroxide and the lactic acid simutaneously or sequentially to the resulting aqueous mixture obtained in step a) until having a composition having a pH from 2 to 3.6.

[0108] In an embodiment, steps a), a'), b) and c) are performed under continuously stirring. In an embodiment, steps a), a') and b) are performed at room temperature. The term "room temperature" refers to a temperature of the environment, without heating or cooling, and it is generally from 20°C to 25°C.
In an embodiment, step a) is performed by simultaneoulsy addition of the organic phosphonic acid and the additives (if present). In an embodiment, step b) comprises: firstly, adding the organic phosphonic acid; and secondly the simultaneulsly or sequentcially addition of the additives (if present). The addition of the additives can be performed in any order.

[0109] In an embodiment, step b) is performed by simultaneoulsy addition of the hydrogen peroxide and the lactic acid. In an embodiment, step b) comprises: firstly, the addition of the hydrogen peroxide followed by the addition of the lactic acid.

[0110] In an embodiment, step a) comprises mixing from 80% to 100% of the total amount of water for providing the aqueous mixture containing the organic phosphonic acid of step a).

[0111] In an alternative embodiment, for the preparation of the composition of the first aspect of the invention comprises:

c) providing an aqueous mixture of the organic phosphonic acid, the lactic acid and, if present, the additives (such as surfactants, solvents and builders); and
d) adding separately the hydrogen peroxide and water to the resulting mixture of step c), wherein the addition is performed simutaneously or sequentially until obtaning a composition having a pH from 2 to 3.6.

This process is advantegeous because can be perfomed in batches or in a continuous form.

[0112] In an embodiment, steps c) and d) are performed under continuously stirring. In an embodiment, steps c) and d) are performed at room temperature.

[0113] In an embodiment, step c) is performed by simultaneoulsy addition of the organic phosphonic acid and the additives (if present). The addition of the additives can be performed in any order.

[0114] The third aspect of the invention relates to the use of the composition of the first aspect of the invention as disinfectant and cleaner. As used herein, the terms "disinfectant" and "disinfecting" have the same meaning and are used interchangeable. They refer to its ability of destroying, detering, rendering harmless and/or exerting a controlling effect on any harmful organism (including bacteria, fungi, spores, viruses, moulds and yeast), which exist on a non-living surface.

[0115] For the purpose of the invention, a composition is considered effective as a disinfectant having bactericidal and fungicidal activity wherein the composition complies with the bactericide and fungicide activity of the UNE-

EN13697:2015 regulation on surfaces, which includes between others, *Pseudomona aeroginosa* and *Aspergillus brasiliensis* as *reference microorganisms.* For instance, the composition of the present invention reduces at least in a number of 4 logaritmic units against *Pseudomona aeroginosa* and at least in a number of 3 logaritmic units against *Aspergillus brasiliensis* as it is shown in the experimental section. And, for the purpose of the invention, a composition is considered effective as a disinfectant having viricidal activity wherein the composition reduces at least in a number of 4 logaritmic units against rellevant virus such as *Vacciniavirus* and *Coronavirus 229E* as it is shown in the experimental section.

[0116] The composition of the invention includes the effective amount of each ingredient for performing its disinfecting action.

[0117] The composition of the present invention is also appropriate for being used as cleaner agent. The terms "cleaner agent" or "cleaning composition" refers to a composition that when applied to non-living surfaces, effectively removes foreign matter located on the surface. For the purpose of the invention the term "cleaning" encompasses composition capable of removing lime, soap (foam, scum and stains) and grease from non-living surfaces. For the purpose of the invention, a composition is considered effective as cleaning agent wherein the laboratory results according to the IKW method (available in the website https://www.ikw.org/fileadmin/ikw/downloads/Haushaltspflege/HP_EQ_AZR_2017_E.pdf on May 5th, 2020) show a low amount of traces (equal to or lower than 2.5) and a cleaning between 6-10 out of 10; and the removal of lime and soap residues is over 70% as it is shown in the experimental section.

[0118] It is also part of the invention a method for disinfecting and cleaning a non-living surface comprising contacting the non-living surface with the composition of the first aspect of the present invention. The term "non-living surfaces" encompasses hard-surfaces such as those typically found in hospital environments (e.g., operating theatres, surgical areas, recovery areas, moveable equipment such as gurneys, beds, and the like), medical laboratories, medical treatment environments, food services, food processing, and those found in residential and commercial spaces like kitchens, bathrooms, such as tiles, walls, floors, chrome, glass, smooth vinyl, any plastic, plasticized wood, table top, sinks, cooker tops, dishes, sanitary fittings such as sinks, showers, shower curtains, wash basins and toilets. The term "non-living surfaces" also include objects such as medical tools and food services equipment such as utensils.

[0119] In an embodiment, the method for disinfecting and cleaning of the present invention comprises contacting the surface with the composition for an exposure time from 1 min to 15 min, depending on the activity to reach. As it is demonstrated in the experimental data, only the compositions of the present invention are non-toxic non-irritant and allows having an efficient disinfectant activity and achieving a very thorough and at the same time broad cleaning effect with a short exposure time and without causing damage to the surface to be treated.

[0120] Throughout the description and claims the word "comprise" and variations of the word, are not intended to exclude other technical features, additives, components, or steps. Furthermore, the word "comprise" encompasses the case of "consisting of". Additional objects, advantages and features of the invention will become apparent to those skilled in the art upon examination of the description or may be learned by practice of the invention. The following examples are provided by way of illustration, and they are not intended to be limiting of the present invention. Furthermore, the present invention covers all possible combinations of particular and preferred embodiments described herein.

Examples

1. Compositions

1.1. Compositions of the invention

[0121] The qualitative and quantitative composition of the of the liquid disinfectant and cleaning solutions of the present invention are shown in Tables 1 and 2, wherein the amount of each of the components are expressed in weight percent.

[0122] Tables 1 and 2 show the composition of the invention which have cleaning effect and effective disinfectant activity.

Table 1

Ingredients	function	Ex.1	Ex.2	Ex.3	Ex.4
Hydrogen Peroxide	Oxidant	**1.5**	**1.5**	**1.5**	**1.5**
1-hydroxyethylidene-1,1-diphosphonic acid (HEDP). (Dequest 2010 LC)	Organic phosphonic acid	**0.3**	**0.3**	**0.21**	**0.3**
Phosphonic acid (Dequest 2010 LC)	pH adjusting	0.01	0.01	-	0.01

(continued)

Ingredients	function	Ex.1	Ex.2	Ex.3	Ex.4
Lactic acid	Acid	**0.25**	**0.35**	**0.45**	**0.75**
Ethanol	Solvent	2.88	2.88	2.88	2.88
dipropylene glycol n-butyl ether (Dowanol dPnB)	Solvent	-	-	-	-
Dipropilenglicol	Solvent	-	-	-	-
glutamic acid, N,N-diacetic acid tetrasodium salt (Dissolvine GL 38)	Builder	0.08	0.08	0.04	0.08
decyldimethyl-aminoxide (Tegotens DO)	Amphoteric Surfactant	0.51	0.51	0.43	0.51
C8/C10 wheat bran glycoside (Appyclean 6781-S)	Non-ionic Surfactant	0.96	0.96	1.11	0.96
capryloyl/capryl methyl glucamide (Glucopure wet)	Non-ionic Surfactant	-	-	-	-
Perfume	perfume	0.4	0.4	0.4	0.4
Deionized water	Solvent	100 cs	100 cs	100 cs	100 cs
pH		3.0	3.0	3.0	2.8
Total amount		100	100	100	100

Table 2

Ingredients	function	Ex.5	Ex.6	Ex.7
Hydrogen Peroxide	Oxidant	**1.5**	**1.5**	**2.5**
1-hydroxyethylidene-1,1-diphosphonic acid (HEDP). (Dequest 2010 LC)	Organic phosphonic acid	**0.3**	**0.3**	**0.3**
Phosphonic acid (Dequest 2010 LC)	pH adjusting	0.01	0.01	0.01
Lactic acid	Acid	**0.35**	**0.5**	**0.36**
Ethanol	Solvent	2.88	2.88	-
dipropylene glycol n-butyl ether (Dowanol dPnB)	Solvent	3.0	-	-
Dipropilenglicol	Solvent	-	-	5.0
glutamic acid, N,N-diacetic acid tetrasodium salt (Dissolvine GL 38)	Builder	0.08	0.08	0.08
decyldimethyl-aminoxide (Tegotens DO)	Amphoteric Surfactant	0.51	0.51	0.49
C8/C10 wheat bran glycoside (Appyclean 6781-S)	Non-ionic Surfactant	1,00	0.96	0.96
capryloyl/capryl methyl glucamide (Glucopure wet)	Non-ionic Surfactant	0.5	-	-
Perfume	perfume	-	0.4	0.4
Deionized water	Solvent	100 cs	100 cs	100 cs
pH		3.0	3.0	3.0
Total amount		100	100	100

1.2. Comparative compositions of the invention

[0123] The qualitative and quantitative comparative composition falling outside the scope of the present invention are shown in Table 3, wherein the amount of each of the components are expressed in weight percent.

[0124] In particular, the comparative compositions 1, 4, 5, 7 and 9 comprise an amount of lactic acid outside the claimed ranges (the amount of lactic acid in the Comp. Ex. 1 and 4 is higher than the claimed range, and in the Comp. Ex. 5, 7 and 9 is lower than the claimed range). Further, comparative compositions 1 and 4 do not comprise an organic phosphonic acid; and the comparative composition 5 also has a pH value higher than the claimed range. Besides, comparative compositions Examples 6 and 8 do not contain lactic acid. And, the comparative compositions 2 and 3 contain formic acid instead of lactic acid.

Table 3

Ingredients	function	Comp. Ex. 1	Comp. Ex.2	Comp. Ex.3	Comp. Ex.4
Hydrogen Peroxide	Oxidant	1.5	1.5	1.5	1.5
1-hydroxyethylidene-1,1-diphosphonic acid (HEDP). (Dequest 2010 LC)	Organic phosphonic acid	-	-	0.3	-
Phosphonic acid (Dequest 2010 LC)	pH adjusting	-	-	0.01	-
Lactic acid	Acid	**2**	**-**	**-**	**2**
Formic acid	Acid	-	**0.6**	**1.2**	-
Ethanol	Solvent	2.9	2.9	2.9	2.9
dipropylene glycol n-butyl ether (Dowanol dPnB)	Solvent	-	-	-	-
Dipropilenglicol	Solvent	-	-	-	-
glutamic acid, N,N-diacetic acid tetrasodium salt	Builder	0.08	0.08	0.08	-
(Dissolvine GL 38)					
Methylglycine N,N-diacetic acid trisodium salt (MGDA) (Dissolvine M40)	Builder	-	-	-	0.3
decyldimethyl-aminoxide (Tegotens DO)	Amphoteric Surfactant	0.51	0.51	0.51	0.51
C8/C10 wheat bran glycoside (Appyclean 6781-S)	Non-ionic Surfactant	0.96	0.96	0.96	0.96
capryloyl/capryl methyl glucamide (Glucopure wet)	Non-ionic Surfactant	-	-	-	-
Perfume	perfume	0.4	0.4	0.4	0.4
Deionized water	Solvent	100 cs	100 cs	100 cs	100 cs
pH		ND	ND	2.6	3.07
Total amount		100	100	100	100
ND: not determined					

Table 3-cont

Ingredients	function	Comp. Ex. 5	Comp. Ex.6	Comp. Ex.7	Comp. Ex.8	Comp. Ex.9
Hydrogen Peroxide	Oxidant	1.5	1.5	2.0	2.5	1.5

(continued)

Ingredients	function	Comp. Ex. 5	Comp. Ex.6	Comp. Ex.7	Comp. Ex.8	Comp. Ex.9
1-hydroxyethylidene-1,1-diphosphonic acid (HEDP). (Dequest 2010 LC)	Organic phosphonic acid	0.21	0.47	0.3	0.3	0.39
Phosphonic acid (Dequest 2010 LC)	pH adjusting	-	0.01	0.01	0.01	0.01
Lactic acid	Acid	**0.20**	**-**	**0.09**	**-**	**0.20**
Formic acid	Acid	-	-	-		-
Ethanol	Solvent	2.9	2.9	2.9	2.9	2.9
dipropylene glycol n-butyl ether (Dowanol dPnB)	Solvent	-	-	-	-	-
Dipropilenglicol	Solvent	-	-	-	-	-
glutamic acid, N,N-diacetic acid tetrasodium salt (Dissolvine GL 38)	Builder	0.11	0.08	0.08	-	0.04
Methylglycine N,N-diacetic acid trisodium salt (MGDA) (Dissolvine M40)	Builder	-	-	-	-	-
decyldimethyl-aminoxide (Tegotens DO)	Amphoteric Surfactant	0.59	0.49	0.49	-	0.43
C8/C10 wheat bran glycoside (Appyclean 6781-S)	Non-ionic Surfactant	1.11	0.96	0.96	0.75	1.11
capryloyl/capryl methyl glucamide (Glucopure wet)	Non-ionic Surfactant	-	-	-	-	-
Perfume	perfume	0.4	0.4	0.4	-	0.4
Deionized water	Solvent	100 cs	100 cs	100 cs	100 cs	100 cs
pH		**3.82**	3.1	3.1	ND	ND
Total amount		100	100	100	100	100
ND: not determined						

2. Preparation process

[0125] The compositions of the invention and the comparative composition as defined above were prepared following the general process as defined below using the ingredients and the amounts specified in Tables 1, 2 and 3 respectively.

General process

[0126]

Step a) In a recipient with the 90% of the amount of the total water specified in the corresponding table; the organic phosphonic acid, and, if present, the additives (such as surfactants, solvents, builders and fragrances) were sequentially added under stirring until a transparent solution is obtained;
Step b) The hydrogen peroxide was added to the resulting mixture obtained in step b) under stirring, followed by the addition of the acid until adjusting the pH of the solution to that specified in the corresponding table; and
Step c) the 20% of the amount of water was added to the solution obtained in step c) to obtain the final composition.

[0127] The resultant compositions can be conditioned in small recipients of 100ml or in big reactors of 30 Tn.

[0128] Alternatively, the fragrances (if present) can be added separately to the rest of additives (which are added in step a), Partiuclarly, the fragrances can be added to the resulting mixture obtained in step a) maintaining the stirring until an homogeneous solution was obtained (step a').

3. Stability evaluation

[0129] The stability evaluation of the compositions of examples 2, 3 and 5 of the present invention and the comparative example 4 was performed. The method used was based on the CIPAC MT46.3 protocol.

Method:

[0130] The tested compositions were stored at 54°C ± 2°C during 2 weeks period in its commercial packaging material (PE bottle). Only Example 5 was stored at 40°C during 12 weeks, which is an equivalent condition of stability. The determination of the hydrogen peroxide content from the tested compostions was performed according to CIPAC MT46.3 protocol. The % of degradation is calculated using the following equation:

$$(\%H_2O_2 \text{ initial} - \%H_2O_2 \text{ final})/\%H_2O_2 \text{initial}$$

[0131] The determination of the pH value was done following CIPAC guideline MT75.3.

[0132] A second determination of the hydrogen peroxide content from dopped compositions containing 10 ppm of Fe was measured. The % of degradation is calculated using the following equation: $(\%H_2O_2 \text{ initial} - \%H_2O_2 \text{ final})/\%H_2O_2 \text{initial}$.

[0133] The results of the stability tests of the tested compositions are summarized in the following Table:

Stability Test	**Ex.2**	**Ex.3**	**Ex.5**	**Comp. Ex. 4**
Physical-Chemical Evaluation Tfinal	Good stability	Good stability	Good stability	Good stability
pH (after 2 weeks at 54°C)	3.05	3.0	3.2(1)	ND
stability (% degradation H_2O_2) (after 2 weeks at 54°C)	1.3%	2.50%	5.3%(1)	**9.73%**
stability (% degradation H_2O_2) + 10ppm Fe (after 2 weeks at 54°C)	6.85%	-	-	**49%**
(1)Conditions: 12 weeks at 40°C, which are equivalent at 2 weeks at 54°C, following CIPAC guidelines. ND: not determined				

[0134] As it is shown in the physical and chemical evaluation test results, there are not significant changes in the colour, olour, pH values, packaging and weight loss as well as in the spray characterization test for the tested compositions of the present invention. On the contrary, there were observed significant changes of instability in the tested comparative compositions which include an amount of lactic acid outside the claimed ranges, which is an amount about 2% but the organic phosphonic acid is absent.

[0135] Furthermore, the percentage of hydrogen peroxide degraded after submitting the tested compositions under the stability test conditions show that the hydrogen peroxide is only stable in the composition of the invention, while the comparative compositions have a degradation degree of hydrogen peroxide equal to or higher than 9%.

[0136] Therefore, the overall results show that only the compositions of the present invention comprising the hydrogen peroxide, the organic phosphonic acid and the lactic acid in the claimed amounts meets the specifications stablish by the FAO/WHO to guarantee a toxicological safety and ensuring an appropriate disinfectant and cleaning effectivenes.

4. Disinfectant Test

[0137] The aim of the below-disclosed tests is the evaluation of the biocide activity of the compositions of the present invention in comparison with the comparative compositions falling outside the scope of the present invention. In particular, the bactericidal, fungicidal and/or viricidal activity were measured for the tested compositions (Examples 1, 2, 4, 5 and 7; and Comp. Ex. 6, 7 and 8).

[0138] The procedure of the disinfectant test is based on the European Norms (Guidance on the Biocidal Product Regulation):

Phase II - step I: UNE-EN1276:2010 (5 min), UNE-EN1650:2008+A1:2013 (15 min);

Phase II - step II: UNE-EN13697:2015 (5 min bacteria and 15 min fungi);

Phase II - Step II: DIN-EN16615:2015 adapted for soiling conditions to domestic area (5 min bacteria and 15 min fungi);

Phase II - step I: UNE-EN14476:2014 (vaccinia) (5 min); based on EN14476:2013 (H_1N_1 virus and herpes virus) (5 min); based on NF-EN14476:2013+A2:2019 (Human coronavirus 229 E) (5 min);

[0139] The tested microorganisms, fungui and virus of study were: *Pseudomonas aeruginosa, Staphylococcus aureus, Enterococcus hirae (EH), Escherichia coli, Candida albicans, Aspergillus brasiliensis (AB), H1N1 Virus, Human Coronavirus 229E* and *Vaccinia Virus.*

[0140] The conditions for each assay are published in the BPR guidance (**Regulation** (EU) 528/2012) and depends on the organisms to be tested and the use of the composition. For the current case, the conditions are the following:

- Contact time: 5 min for bacteria and virus and 15 min for yeast and moulds.
- Conditions of assay (clean or dirty): Dirty conditions for home care products.
- Temperature: 20°C

[0141] The results of the disinfectant assay are summarized in Table below:

Disinfectant Test	**Ex.1**	**Ex.2**	**Ex.4**	**Ex.5**	**Ex.7**	**Comp. Ex.6**	**Comp. Ex.7**	**Comp. Ex.8**
Bactericidal Efficacy(1)	>6log	>6log	>6log	>6,23log	>6,13log	**1,53log**	>5,73 log	-
Fungicidal Efficacy(2)	>3log	>3log	>3log	>5,83log	>4,0 log	>3log	**1,99log**	**1,63log**
Viricidal Efficacy(3)	ND	>6log	ND	>6log	ND	ND	ND	ND
Viricidal Efficacy(4)	ND	>6log	ND	>6log	ND	ND	ND	ND
ND: not determined (1) tested agaisnt *Enterococcus hirae (EH)* (2) tested against *Aspergillus brasiliensis (AB)* (3) tested against H1N1/Vaccinia Virus (5min) (4) tested against Human Coronavirus 229E (5min)								

[0142] As it is shown in table above, it is demonstrated that the compositions of the present invention are biocide. In particular, the compositions of the invention show a triple bactericidal, fungicidal and viricidal activity even of comprising a low amount of hydrogen peroxide from 0.5 and 2% by weight (Ex. 1, 2, 4 and 5).

[0143] Meanwhile, the comparative compositions which does not contain lactic acid (Comp. Ex. 6 and 8) or contain it in a very low amount falling outside of the claimed range (Comp. Ex. 7 having a 0.09%) do not have an efficient disinfectant effect. Surprisingly, the inefficient disinfectant effect is not enhanced even of increasing the amount of hydrogen peroxide until 2.5% by weight (Comp. Ex. 9).

5. Cleaning Test

[0144] The aim of the below-disclosed tests is the qualitatively evaluation of the cleaning capacity of the compositions of the present invention in comparison with the comparative compositions falling outside of the scope of the present invention. In particular, the anti-lime and soap removal capability, the traces evaluation test and the degreasing effect are measured.

5.1. Lime Soap scale Test

[0145] The lime and soap removal effect of the compositions of the present invention (Ex. 2 and 4) was performed.The aim of this test is the qualitative and quantitative evaluation of the cleaning capacity of the above-mentioned tested compositions regarding the removal of lime and soap from surfaces.

[0146] Particularly, to the effect that a consumer can appreciate in the domestic clean by the use of the tested compositions was evaluated. In particular, the procedure is based in the contact for 5 min of the tested compositions with a surface impregnated with a mixture of lime and soap. The hard surface can be a metal or ceramic tile as these are the most representative surfaces in the domestic area. After 5 min of exposition, the surface must be treated with distilled water and the efficacy is evaluated.

Herein below is disclosed the procedure test:

[0147]

1. Clean the tile with acid water.
2. Rinse with distilled water.
3. Dry the tile
4. Prepare the solution for spraying (keep stirring before the test):
    a. 85 % Ethanol
    b. 5 % Calcium stearate
    c. 10 % Distilled water
5. Tare the tile and spray from above and with continuous movement to spread over the entire surface the product. 3-4 gr of solution should be deposited per tile.
6. Keep drying the tile for 1 hour at room temperature.
7. Introduce the tile for 1 hour to the oven at 180°C.
8. After 1 hour, remove the tile of the oven and let it cool at room temperature.
9. Let it rest for 1 hour.
10. With the tile in horizontal position, put the rings on top with a separation of few cm between them.
11. Take 1,5 ml of product with a pipette and distribute it in the hollow of the ring.
12. Let it work for 5 minutes.
13. After 5 minutes, put the tile in vertical position and clean with distilled water.

[0148] The capacity of removing the lime from the surface shows the efficacy of the composition on the surface using a visually scale rate. In particular, the scale rate was determined by the evaluation of the circle of the tile (which leaves the ring). The less lime it is leaved in the circle (circle more shiny), the better antime and soap cleaning efficacy is.

[0149] The results are expressed as follows:

% calcium estearate removal	Efficacy
0-10%	Very poor efficacy
10%-25%	Poor efficacy
25%-50%	Medium efficacy
50%-75%	Medium -high efficacy
75%-100%	High efficacy

[0150] The degree of lime and soap removal is expressed in percentage in relation to the initial amount. The higher the percentage, the better the lime scale and soap removal effect.

5.2. Traces Evaluation Test

[0151] The traces Test of the compositions of the present invention (Ex. 2 and 4) was performed.The aim of this test

is the quantitative evaluation of the amount of visual residues that remains on the treated surface after the application of the tested compositions. The amount of visual residues on a surface is correlated with its brightness. The more the number of visual residues, the less brightness of the surface.

[0152] The method used is the HP_EQ_AZR_2017_E protocol (IKW Recommendation for the Quality Assessment of the Product Performance of All-Purpose Cleaners 2014).

[0153] The amount of traces on the surface are scored from 0 to 10, being 0 the no presence of traces (total elimination of visual residues) and 10 the nule elimination of visual residues. Thus, the lower the score number, the better the traces removal.

5.3. Degreasing Evaluation Test

[0154] The degreasing Evaluation Test of the compositions of the present invention (Ex. 2 and 4) was performed.The aim of this test is the quantitative evaluation of the amount of grease and particulate dirt that remains on the treated surface after the application of the tested compositions.

[0155] The method used is the HP_EQ_AZR_2017_E protocol (IKW Recommendation for the Quality Assessment of the Product Performance of All-Purpose Cleaners 2014).

[0156] The amount of grease on the surface are scored from 0 to 10, being 0 the nule elimination of grease and 10 the no presence of grease (total elimination of grease). Thus, the higher the score number, the better the grease removal.

5.4. Results

[0157] The Table below summarize the results of the lime soap scale test, the traces evaluation test and the degreasing evaluation test.

	Ex.2	**Ex.4**
Lime soap scale test	75-100%	75-100%
Traces evaluation Test	1	1
Degreasing evaluation Test	6	8.5

[0158] As it is shown in the above results, the compositions of the present invention are capable of being used as cleaning compositions. In particular, it is demonstrated that they have a high efficiency for as anti-lime agent and also useful for the removal of soap removal in the commonly used surfaces at both homeplace and workplace, including delicate surfaces such as metal surfaces and organic based surfaces. Furthermore, it is also demonstrated that the composition of the present invention are also effective as degreasing agent giving at the same time a brightness to the treated surface without damaging it.

6. Material compatibility

6.1. Marble block test

[0159] The lime scale effect of the compositions of the present invention (Ex. 1, 2 and 4) and the comparative example 1-4 was performed by the procedure based in the contact of marble block.

[0160] The aim of this test is the quantitatively evaluation of aggression of on a marble plate caused by the above-mentioned tested compositions. In particular, the procedure is based in the contact of marble block specimens with the tested composition for 5 min and after that time, the evaluation of the weight's loss of the $CaCO_3$ because of the effect of the composition was determinted.

[0161] The result are expressed as loss % of $CaCO_3$ which is calculated using the following formula:

$$\frac{\text{Loss of weight}}{\text{Initial weight}} \times 1000 = \%\ \text{de}\ CaCo_3$$

[0162] The Table below summarise the loss of $CaCO_3$ after the treatment of the surface with the tested compositions.

Lime scale Test	Ex.1	Ex.2	Ex.4	Comp. Ex. 1	Comp. Ex. 2	Comp. Ex. 3	Comp. Ex. 4
Loss of $CaCO_3$ (%)	**0.02**	**0.04**	**0.04**	0.19	0.19	0.12	0.2

[0163] The above-mentioned results show that the compositions of the present invention have not a high impact in the deposits of $CaCO_3$ even though with high concentrations of lactic acid. Furthermore, these results also show that the change of the lactic acid for another acid such as formic acid in the same amount (Comp. Ex. 2 and 3) do neither result in an enhancement of the aggression to the marble plates.

6.2. Wooden surface Test

[0164] The compositions of the present invention (Ex. 2 and 5) were submitted to the material compatibility test based on the UNE-EN 13442 (Wood floors and interior and exterior wood wall coverings. Determination of resistance to chemical agents) changing the paper surface by a calcareum or metallic surface

[0165] The aim of this test is the qualitatively evaluation of the damage caused by the application of the above-mentioned tested compositions over the above-mentioned hard surfaces. In particular, the objective is the determination of the resistance of the carcareoum or metallic element to a predetermined ratio of chemical agents to which it could be exposed during its service life.

[0166] UNE-EN 13442 Method: A paper impregnated with one of the above-mentioned tested composition was placed on the test surface and covered with a Petri dish to prevent evaporation.
After a specified period of time, the paper is removed, the test surface is washed and dried, and visible changes are analyzed. These changes are evaluated against a numerical classification code.

[0167] The procedure of the method is summarized herein below:

- Place the test surfaces in a horizontal position.
- The piece of filter paper is immersed in the tested composition for (30±1) s, it is removed with the clamp and the excess is drained through the edge of the container. The filter paper is quickly placed on the test surface and quickly covered with an upside-down Petri dish. The filter paper should not touch the walls of the Petri dish.
- The position of each paper impregnated in the tested composition on each test surface is noted.
- The duration established for each of the tested surfaces is 24h (+/- 1). After that time, the Petri dish and filter paper are removed with the clamp. Paper fibers adhering to the test surface are not removed (if any). Excess tested composition is absorbed with the absorbent paper or cloth without rubbing and the surface is left to stand for 24 hours without covering.
- After 24 hours of rest, the test surface is cleaned by lightly rubbing it with the absorbent paper or cloth soaked in the cleaning solution and then with another soaked in distilled water. Finally, the surface is carefully cleaned with a dry cloth.
- During this time, the reference area of the test surface that has not been exposed to the tested composition is cleaned and dried in the same way.
- The tested surface is left uncovered (30 ± 1) min uncovered.

[0168] Results: the damage caused by the tested compositions was evaluated by visual examination. A numerical value is associated to the tested area in comparison to the reference area, which has not been exposed to the tested compositions according to the following classification code:

Code	Visual evaluation	Assesment
5	no visible changes	**Good or very good compatibility** with the surface. The use of the composition on those surfaces is advisable.
4	slight change in brightness or color, visible only when light is reflected from the tested surface or very close to the mark or the presence of some isolated marking on the filter paper barely visible	
3	moderate marking of filter paper visible under different angles	**Moderate compatibility** with the surface.
		The use of the composition is advisable, but with some reservations, for example using it with high exposure times on the surface.

(continued)

Code	Visual evaluation	Assesment
2	important mark of the filter paper, leaving the structure of the surface unchanged	**Poor compatibility** with the surface. It would be advisable to avoid frequent use of the composition on the surface.
1	important mark of the filter paper, the structure of the surface is altered: the material being completely or partially removed from the surface, the filter paper adhering to the tested surface or other signs of attack such as corrosion, oxidation or cracking	**Very poor compatibility** with the surface. It should be mentioned on the label that it is recommended not to use the composition on surfaces.

[0169] The results of the compatibility test performed over calcareum and aluminim surfaces are summarized in the following Table:

Compatibility material test	Ex2	Ex5
Compatibility calcareum surfaces	3	3
Compatibility aluminium surfaces	3.5	3.5

[0170] The visual examination of the surfaces treated with the compositions of the invention demonstrate that they have a moderate-good/very good compatibility with the surface (code value ≥ 3), which means that the use of the composition of the present invention are compatible with the most common material used in profesional and domestic facilities.

7. Toxicological evaluation

7.1. *In vitro* skin irritation Test

[0171] The composition of the present invention (Ex. 5) was submitted to the in-use test under dermatological control by the assestment of the cutaneous acceptability of the tested composition, applied under the normal conditions of use for 3 weeks.

[0172] The aim of this test is the determination of the attack of the integrity of the skin by lesions in the epidermis and the appearance of an inflammatory reaction in the dermis, resulting in macroscopically visible phenomena, which manifests from a redness (erythema) to edema. In humans, the use test is performed under Dermatological control allowing the verification of the absence of discomfort reactions or cumulative irritation associated to the application of the tested composition for 3-4 weeks in normal conditions of use, under subjects who met specific inclusion criteria.

[0173] To sum up, this test allows appreciating the effectiveness and cosmetic acceptability of the tested compositions of the present invention.

Inclusion Criteria:

[0174]

Number of subjects: 22
Sex: both
Age: 18 to 70 years old
Origin: Caucasian
Other: 100% sensitive hands skin
Healthy subjects with atopy background: 20-25% maximum

Methodology

[0175]

Area: hands

Application and duration: once a day at least during 3 weeks
Application conditions: by the subjects themselves, at home (starting on D1 and ending on D21) under the normal conditions of use.
Concomitant application of other products: usual cleansing and moisturizing cream.

Evaluations of the cutaneous acceptability:

[0176]

- Clinical examinations by the Dermatologist on D1 and D22 days.
- Questionnaire to be filled in by the subject

Data analysis:

[0177] Calculation of the appearance frequency for the following reactions:

- all reactions observed in the whole study
- reactions noted by the subjects themselves (discomfort, irritation)
- reactions observed by the investigator
- reactions requiring modification in the pace of application, or its interruption
- reactions considered as "pertinent"
- adverse reactions.

[0178] Interpretation of the results obtained under the adopted experimental conditions of use, based on:

- the expected effects, according to the study monitor,
- the type of tested compositions
- analysis of the nature, location, intensity, frequency, duration and appearance period of the reactions.

Conclusions:

[0179] The analysis of the obtained results revealed that as regards irritation or discomfort, a very good acceptability of the composition of the present invention in all subjects who took part in the study. In particular, no abnormal clinical signs were observed by the dermatologist, after 3 weeks of application.

[0180] No subject from any of the 22 healthy adults with sensitive hands skin indicated to have had or observed, after repeating application under normal conditions of use, once a day and at least during 3 consecutive weeks any cutaneous reaction of irritation or discomfort.

Citation List

[0181]

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13. UNE-EN 13442 (Wood floors and interior and exterior wood wall coverings. Determination of resistance to chemical agents)

Claims

1. A composition comprising:

   from 0.5% to 4% by weight of hydrogen peroxide;
   from 0.1% to 0.5% by weight of an organic phosphonic acid;
   from 0.25% to 0.8% by weight of lactic acid; and
   having a pH from 2 to 3.6.

2. The composition according to claim 1, which comprises:

   from 1% to 3.5% by weight of hydrogen peroxide;
   from 0.18% to 0.4% by weight of an organic phosphonic acid;
   from 0.25% to 0.75% by weight of lactic acid; and
   having a pH from 2 to 3.6.

3. The composition according to any of the claims 1 or 2, which comprises:

   from 1% to 3% by weight of hydrogen peroxide;
   from 0.2% to 0.35% by weight of an organic phosphonic acid;
   from 0.3% to 0.75% by weight of lactic acid; and
   having a pH from 2 to 3.6.

4. The composition according to any of the claims 1-3, wherein the organic phosphonic acid is 1-hydroxyethylidene-1,1-diphosphonic acid.

5. The composition according to any of the claims 1-4, further comprises one or more additives selected from the group consisting of solvents, surfactants, builders, pH adjusting agent, pH buffering agents, thickening/viscosity modifying agent, perfumes or fragrances, preservatives; dyes and other colorants; UV absorbents or antioxidizing agents, fabric softening compositions; static control agents; optical opacifiers, and suds regulants.

6. The composition according to claim 5, wherein the one or more additives are one or more solvents selected from the group consisting of alcohols, ethers, ketones, esters and a mixture thereof.

7. The composition according to claim 6, wherein the one or more solvents are selected from the group consisting of ethanol, di(propylene glycol) n-butyl ether, di(propylene) glicol and a mixture thereof.

8. The composition according to any of the claims 5-7, wherein the one or more additives are one or more surfactants selected from the group consisting of amphoteric surfactants, non-ionic surfactants and a mixture thereof.

9. The composition according to claim 8, wherein:

   the amphoteric surfactants comprise one or more amine oxides selected from the group consisting of decyldimethyl-aminoxide, dodecyldimethylamine oxide, tridecyldimethylamine oxide, tetradecyldimethylamine oxide, pentadecyldimethylamine oxide, hexadecyldimethylamine oxide, heptadecyldimethylamine oxide, octadecyldimethylaine oxide, dodecyldipropylamine oxide, tetradecyldipropylamine oxide,
   hexadecyldipropylamine oxide, tetradecyldibutylamine oxide, octadecyldibutylamine oxide, bis(2-hydroxyethyl)dodecylamine oxide, bis(2-hydroxyethyl)-3-dodecoxy-I-hydroxypropylamine oxide, dimethyl-(2-hydroxydodecyl)amine oxide, 3,6,9- trioctadecyldimethylamine oxide, and 3-dodecoxy-2-hydroxypropyldi-(2-hydroxyethyl)amine oxide; and
   the one or more non-ionic surfactant are selected from the group consisting of C8/C10 wheat bran glycoside, capryloyl/capryl methyl glucamide and a mixture thereof.

10. The composition according to any of the claims 5-9, wherein the one or more additives are one or more builders selected from the group consisting of chelating agents, sequestering agents, detergent builders and a mixture thereof.

11. The composition according to claim 10, wherein the one or more builders are selected from the group consisting of methyl glycine N,N-diacetic acid trisodium salt; glutamic acid, N,N-diacetic acid tetrasodium salt and a mixture thereof.

12. The composition according to any of the claims 1-11, comprising:

from 0.5% to 4% by weight of hydrogen peroxide;
from 0.1% to 0.5% by weight of an organic phosphonic acid;
from 0.25% to 0.8% by weight of lactic acid;
from 0.1 to 6.5% by weight of surfactats;
from 3 to 7% by weight of solvents; and
from 0 to 1% by weight of builders;
being the sum of all the components up to 100% by weight; and
having a pH from 2 to 3.6.

13. The composition according to any of the claims 1-12, comprising:

from 0.5% to 4% by weight of hydrogen peroxide;
from 0.1% to 0.5% by weight of 1-hydroxyethylidene-1,1-diphosphonic acid (HEDP);
from 0.25% to 0.8% by weight of lactic acid;
from 0.1 to 2.5 % by weight of decyldimethyl-aminoxide;
from 0.2 to 4 % by weight of C8/C10 wheat bran glycoside;
from 0 to 4 % by weight of capryloyl/capryl methyl glucamide;
from 3 to 7 % by weight of ethanol
from 0 to 1% by weight of glutamic acid, N,N-diacetic acid tetrasodium salt;
sufficient amount up to 100% by weight of water;
being the sum of all the components up to 100% by weight; and
having a pH from 2 to 3.6.

14. Use of the composition as defined in any of the claims 1-13 as disinfectant and cleaning agent.

15. A method of disinfecting and cleaning a non-living surface comprising applying a composition as defined in any of the claims 1-13.

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EUROPEAN SEARCH REPORT

Application Number
EP 20 38 2501

DOCUMENTS CONSIDERED TO BE RELEVANT

Category	Citation of document with indication, where appropriate, of relevant passages	Relevant to claim	CLASSIFICATION OF THE APPLICATION (IPC)
A	WO 2016/040230 A1 (LONZA AG [US]) 17 March 2016 (2016-03-17) * claims * * example 2; table 3 * * page 6, paragraph 42 - paragraph 44 * * page 7, paragraph 46 - paragraph 47 * * pages 9-10, paragraph 57 * -----	1-15	INV. C11D3/48 C11D3/39 C11D3/20 C11D3/36 C11D7/26 C11D7/36
A	WO 2008/003779 A1 (CENTENNIAL VENTURES B V [NL]; BOBBERT ILJA [NL]) 10 January 2008 (2008-01-10) * claims * * Composition V; page 19 * * page 11, line 6 - line 19 * -----	1-15	
A	US 2012/230869 A1 (RAMIREZ JOSE A [US] ET AL) 13 September 2012 (2012-09-13) * Compositions U, V and W; example XIV * * claims * * page 1, paragraph 9 - paragraphs 10, 12 * -----	1-15	TECHNICAL FIELDS SEARCHED (IPC) C11D A61L
A	EP 0 845 526 A2 (EKA CHEMICALS AB [SE]) 3 June 1998 (1998-06-03) * claims * * examples * * column 1, line 58 - column 2, line 29 * -----	1-15	
A	WO 2006/097666 A1 (RECKITT BENCKISER INC [US]; BOONE PAMELA A [US] ET AL.) 21 September 2006 (2006-09-21) * examples 13-18 * * claims * * page 3, line 20 - page 4, line 19 * * page 22, line 12 - page 23, line 29 * -----	1-15	

The present search report has been drawn up for all claims

Place of search	Date of completion of the search	Examiner
The Hague	5 November 2020	Neys, Patricia

CATEGORY OF CITED DOCUMENTS

X : particularly relevant if taken alone
Y : particularly relevant if combined with another document of the same category
A : technological background
O : non-written disclosure
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T : theory or principle underlying the invention
E : earlier patent document, but published on, or after the filing date
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L : document cited for other reasons

& : member of the same patent family, corresponding document

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ANNEX TO THE EUROPEAN SEARCH REPORT ON EUROPEAN PATENT APPLICATION NO. EP 20 38 2501

This annex lists the patent family members relating to the patent documents cited in the above-mentioned European search report. The members are as contained in the European Patent Office EDP file on
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