

(19)



(11)

EP 4 032 967 A1

(12)

EUROPEAN PATENT APPLICATION

(43) Date of publication:

27.07.2022 Bulletin 2022/30

(21) Application number: **22151512.5**

(22) Date of filing: **14.01.2022**

(51) International Patent Classification (IPC):

C11D 3/39 ^(2006.01) **C11D 3/40** ^(2006.01)
C11D 11/00 ^(2006.01) **C11D 17/00** ^(2006.01)
C11D 3/20 ^(2006.01) **C11D 3/30** ^(2006.01)
C11D 1/44 ^(2006.01) **C11D 1/42** ^(2006.01)

(52) Cooperative Patent Classification (CPC):

C11D 3/3942; C11D 1/42; C11D 3/2075;
C11D 3/30; C11D 3/40; C11D 11/0023;
C11D 17/0008

(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

(30) Priority: **26.01.2021 EP 21153373**

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Designated Contracting States:

AL AT BE BG CH CZ DK EE ES FI FR GR HR HU
IS LI LT LU LV MC MK NL NO PL PT RO SE SI SK
SM

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CY DE GB IE IT MT RS TR

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(54) **LIQUID AQUEOUS COLOURED CLEANING COMPOSITION**

(57) The present invention relates a liquid aqueous coloured cleaning composition comprising hydrogen peroxide, ethoxylated amine, water-soluble organic dye and organic acid having a pKa of from 1 to 5.5. The composition has a pH of 2 to 5 and a viscosity at 25°C of 1 to 1000 mPa.s @ 20 s-1.

EP 4 032 967 A1

Description**Field of the invention**

5 **[0001]** The present invention relates to liquid aqueous coloured cleaning compositions. More specifically it relates to colour stable acidic liquid aqueous cleaning compositions comprising hydrogen peroxide and water-soluble organic dye.

Background of the invention

10 **[0002]** Cleaning products are well-known and play an important role in everyday life. Cleaning products for cleaning sanitary hard surfaces like toilets and other bathroom surfaces like for example floors and tiles usually comprise a disinfection agent and if desired further cleaning agents like surfactants. A well-known disinfecting agent often used in such products is hypochlorite as hypochlorite is a recognized disinfecting agent against bacteria and viruses. However, some consumers prefer a milder disinfecting agent, as hypochlorite has the risk of damaging delicate surfaces as it is a strong oxidizer and has a distinctive smell that is not always appreciated.

15 **[0003]** An alternative disinfecting agent used in cleaning products for sanitary hard surfaces is hydrogen peroxide. Hydrogen peroxide has a less distinctive smell and is generally considered to be a milder disinfecting agent. To provide adequate disinfection a certain amount of hydrogen peroxide needs to be present. Hydrogen peroxide is not always storage stable and may (at least in part) decompose over time upon storage thereby potentially diminishing its disinfection efficacy. To overcome this problem formulators sometimes overdose the amount of hydrogen peroxide to compensate for loss of hydrogen peroxide over time. In addition, other measures may be taken to stabilize the hydrogen peroxide and minimize loss by decomposition thereof. A common understanding is that hydrogen peroxide stability in acidic aqueous compositions increases as the pH goes down.

20 **[0004]** Acidic cleaning compositions comprising hydrogen peroxide are suitable cleaning compositions for cleaning and disinfecting toilet surfaces. Some consumers may prefer coloured cleaning liquids as this provides a visual cue showing where the cleaning liquid has been applied. Hydrogen peroxide comprising acidic cleaning compositions may not always be compatible with water-soluble organic dyes resulting in fading of colour intensity over time, e.g. upon storage. To overcome this problem, dispersed pigments, i.e. water insoluble inorganic compounds, are sometimes used. However, this results in translucent or even opaque liquids, that may not be preferred by consumers. Water-soluble organic dyes may be preferred to allow for a transparent liquid that may have more consumer appeal.

25 **[0005]** CN110257183 discloses a toilet cleansing deodorant comprising oleylamine polyoxyethylene (2) ether, octadecyltrimethylammonium chloride, hydrogen peroxide, citric acid and tourmaline anion powder.

30 **[0006]** In view of the above, there remains a need for acidic hydrogen peroxide comprising cleaning compositions that are coloured and transparent and are colour stable over time.

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Summary of the invention

[0007] We have found that an ethoxylated amine with an unsaturated alkyl group provides colour stabilization in acidic liquids comprising hydrogen peroxide and water-soluble organic dye.

40 **[0008]** Accordingly, in a first aspect the invention relates to a liquid aqueous coloured cleaning composition comprising

- 0.5 to 4 wt% hydrogen peroxide;
- 0.1 to 5 wt% ethoxylated amine with a C12 to 22 unsaturated alkyl group and 1 to 50 ethoxylate groups;
- Water-soluble organic dye;
- 45 • 0.25 to 5 wt% organic acid having a pKa of from 1 to 5.5;

wherein the composition optionally comprises ethoxylated amine with a saturated alkyl group and the weight ratio of ethoxylated amine with an unsaturated alkyl group to ethoxylated amine with a saturated alkyl group is at least 1:1; and wherein the composition has a pH of 2 to 5 and a viscosity at 25°C of 1 to 1000 mPa.s @ 20 s-1.

50 **[0009]** The invention further relates to a method of cleaning a toilet comprising the step of:

- a. contacting at least part of the toilet surface with the composition according to the present invention; and
- b. optionally rinsing the surface with water.

55 **[0010]** The invention also relates to the use of an ethoxylated amine with a C12 to 22 unsaturated alkyl group and 1 to 50 ethoxylate groups to stabilize water-soluble organic dye in a composition according to the present invention.

Detailed description of the invention

[0011] Any feature of one aspect of the present invention may be utilized in any other aspect of the invention. The word "comprising" is intended to mean "including" but not necessarily "consisting of" or "composed of." In other words, the listed steps or options need not be exhaustive. Except in the operating and comparative examples, or where otherwise explicitly indicated, all numbers in this description indicating amounts of material or conditions of reaction, physical properties of materials and/or use are to be understood as modified by the word "about". Numerical ranges expressed in the format "from x to y" are understood to include x and y. When for a specific feature multiple preferred ranges are described in the format "x to y", it is understood that all ranges combining the different endpoints are also contemplated. Unless specified otherwise, amounts as used herein are expressed in percentage by weight based on total weight of the composition and is abbreviated as "wt%". The use of any and all examples or exemplary language e.g. "such as" provided herein is intended merely to better illuminate the invention and does not in any way limit the scope of the invention otherwise claimed. Room temperature is defined as a temperature of about 25 degrees Celsius.

Aqueous cleaning composition

[0012] The cleaning composition of the present invention is an aqueous cleaning composition, that is to say, the composition comprises water. The amount of water will depend on the desired concentration of the other ingredients but will at least be 80 wt%, like for example at least 85 wt% or at least 90 wt%, but typically not more than 99 wt%. The amount of water preferably is from 80 to 99 wt%, more preferably 80 to 95 wt% and even more preferably 85 to 95 wt%.

[0013] The composition is liquid, that is, it can be poured, and has viscosity at 25°C of 1 to 1000 mPa.s @ 20 s⁻¹. The viscosity is measured using an AR 1000 Rheometer (TA instruments) using a 4 cm, 2° cone-plate geometry @ 20 s⁻¹ and 25°C. Depending on the required use characteristics the composition may be more or less viscous. For example, a more water thin viscosity is desired if the composition is to be used in a trigger spray bottle. To increase contact time with a hard surface, the composition may be formulated to have a certain viscosity such that the product is easier to apply and clings to the surface. If dispensed from a squeeze bottle, a more viscous consistency may be desired. A more viscous viscosity may also be desired if the cleaning product is a toilet cleaning product. Preferably the composition has a viscosity of 100 to 700 mPa.s @ 20 s⁻¹ and more preferably of 200 to 600 mPa.s @ 20 s⁻¹. The desired viscosity can suitably be obtained by known methods like for example the use of a viscosity modifying agent.

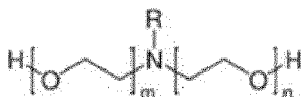
Hydrogen peroxide

[0014] The cleaning composition of the present invention comprises 0.5 to 4 wt% hydrogen peroxide. The amount of hydrogen peroxide is chosen such that it provides adequate disinfection alone or in combination with the other disinfecting agents if present. Preferably the composition comprises 0.6 to 3 wt% hydrogen peroxide, more preferably 0.7 to 2.5 wt% and even more preferably 0.8 to 1.5 wt%.

Ethoxylated amine

[0015] The composition comprises ethoxylated amine with an unsaturated alkyl group having carbon atoms in the range from 12 to 22 and 1 to 50 ethoxylate (EO) groups (ethoxylated amine). The ethoxylated amine comprises from 1 to 50, preferably from 1 to 30, more preferably from 1 to 15, even more preferably from 1 to 10, further more preferably from 1 to 7, still more preferably 1 to 5 and most preferably 1 to 2 EO groups.

[0016] A general structure of ethoxylated amine is as follows:



[0017] Where R is the alkyl chain, number of carbon atom and degree of unsaturation in alkyl chain vary depending on type of ethoxylated amine, m and n represent the number of ethoxylate present in ethoxylated amine.

[0018] By unsaturated alkyl group having carbon atoms in the range from 12 to 22, it will be understood that the alkyl chain attached to the ethoxylated amine may also contain a mixture of alkyl groups e.g. C12, C14, C16, C18, C20 and C22 in varying proportions. Preferably the ethoxylated amine comprises a C16 to 20 unsaturated alkyl group and preferably the ethoxylated amine comprises 1 to 15 ethoxylate groups.

[0019] Preferably, the ethoxylated amine is selected from Bis(2-hydroxyethyl) oleyl amine (e.g. commercially available as Ethomeen® O/12 from Nouyron), Bis(2-hydroxyethyl) soyaalkylamines (e.g. commercially available as Ethomeen®

S/12 from Nouyron) and combinations thereof.

[0020] More preferably, the ethoxylated amine is PEG-2-oleyl amine (e.g. commercially available as Ethomeen® O/12 from Nouyron),

[0021] The composition comprises from 0.1 to 5 wt% of ethoxylated amine, preferably 0.2 to 4 wt%, more preferably 0.3 to 3 wt%, even more preferably 0.4 to 2 wt% and still even more preferably 0.5 to 1 wt%.

[0022] It was surprisingly found that ethoxylated amines with an unsaturated alkyl chain provide for colour stabilization of acidic liquids comprising hydrogen peroxide and water-soluble organic dye.

[0023] The composition optionally comprises ethoxylated amine with a saturated alkyl group. If the composition comprises ethoxylated amine with a saturated alkyl group, then the weight ratio of ethoxylated amine with an unsaturated alkyl group to ethoxylated amine with a saturated alkyl group is at least 1:1. At least 1:1 is to be understood as the composition comprising at least equal weight amounts of ethoxylated amine with an unsaturated alkyl group to ethoxylated amine with a saturated alkyl group or more ethoxylated amine with an unsaturated alkyl group than ethoxylated amine with a saturated alkyl group like for example at least 2:1 or at least 3:1. Preferably the weight ratio of ethoxylated amine with an unsaturated alkyl group to ethoxylated amine with a saturated alkyl group is at least 4:1, more preferably at least 6:1, even more preferably at least 8:1 and still more preferably at least 10:1. Preferably the composition is essentially free of ethoxylated amine with a saturated alkyl group.

Water-soluble organic dye

[0024] The inclusion of a colorant in the cleaning composition not only serves to increase the appeal of the product, but it also makes it easier to apply and verify where and how much product was applied and remains after rinsing with e.g. water.

[0025] The cleaning composition of the present invention comprises water-soluble organic dye as this provides for a transparent liquid contrary to the use of pigments (i.e. inorganic minerals). Pigments will result in translucent or even opaque liquids. Minor amounts of dispersed pigments may be utilized to augment the colour intensity provided by the water-soluble organic dye, but preferably the cleaning composition is free of pigments to allow for a transparent liquid.

[0026] Suitable water-soluble organic dyes include those available under the Liquitint® brand name being water-soluble polymeric colorants from Milliken®.

[0027] Preferably the composition comprises 0.01 to 100 ppm of water-soluble organic dye, more preferably 0.1 to 50 ppm, even more preferably 1 to 10 ppm.

[0028] Preferably the composition is a transparent liquid. It will be appreciated that transparency can be assessed qualitatively by visual inspection. But it can also be assessed quantitatively by measuring the turbidity using Nephelometric Turbidity Units (NTU) as specified by United States Environmental Protection Agency. Preferably the composition has a NTU value of up to 5 NTU.

Organic acid

[0029] The cleaning composition comprises 0.25 to 5 wt% organic acid having a pK_a of from 1 to 5.5. The organic acid is one of the disinfecting agents and may also contribute to obtaining the desired acidic pH. Preferably the amount of organic acid is from 0.5 to 4.5 wt%, more preferably from 1 to 4 wt% and even more preferably from 2 to 4 wt%.

[0030] Examples of suitable organic acids that may be used in the present invention include citric acid ($pK_a = 3.1$), lactic acid ($pK_a = 3.86$), acetic acid ($pK_a = 4.76$), malonic acid ($pK_a = 2.85$), adipic acid ($pK_a = 4.43$), glutaric acid ($pK_a = 3.76$), glycolic acid ($pK_a = 3.83$) and maleic acid ($pK_a = 1.9$), succinic acid ($pK_a = 4.2$), malic acid ($pK_a = 3.4$), tartaric acid (for L+ $pK_a = 2.89$; and for meso $pK_a = 3.22$), hexanoic acid ($pK_a = 4.88$), cyclohexanoic acid ($pK_a = 4.82$), heptanoic acid ($pK_a = 4.8$), octanoic acid ($pK_a = 4.89$), 4-methyl octanoic acid ($pK_a = 5.23$), nonanoic acid ($pK_a = 4.95$), decanoic acid ($pK_a = 4.9$), benzoic acid ($pK_a = 4.2$) and 4-methoxy benzoic acid ($pK_a = 4.37$).

[0031] Preferably the organic acid has a pK_a of 2 to 4.8 and more preferably 3 to 4.

[0032] Preferred organic acids are citric acid, lactic acid, acetic acid, malonic acid, adipic acid, glutaric acid, glycolic acid, maleic acid and combinations thereof. More preferably the organic acid is selected from citric acid, lactic acid, glycolic acid and combinations thereof. A preferred organic acid is citric acid.

pH

[0033] The aqueous cleaning composition of the present invention is an acidic cleaning composition having a pH from 2 to 5. The acidic pH helps to address hard water stains. Preferably the pH is from 2 to 4 and more preferably from 2 to 3. In addition to the present organic acid the desired pH of the composition may be obtained using suitable pH adjusting agents like e.g. hydrochloric acid and sodium hydroxide.

[0034] Preferably the composition is essentially free of mineral acids.

Quaternary ammonium compound

[0035] The aqueous cleaning composition of the present invention may further comprise 0.05 to 3 wt% quaternary ammonium compound as a disinfecting agent. Preferably the composition comprises 0.1 to 2 wt%, more preferably 0.15 to 1 wt% and even more preferably 0.2 to 0.8 wt% of said quaternary ammonium compound.

[0036] The combination of a quaternary ammonium compound with hydrogen peroxide provides a broader disinfectant efficacy, which is further augmented if used in combination with an organic acid.

[0037] Any quaternary ammonium compound can be used in the presently described technology. Examples of quaternary ammonium compounds include, for example, alkyl ammonium halides such as cetyl trimethyl ammonium bromide, alkyl aryl ammonium halides such as octadecyl dimethyl ammonium bromide, N-alkyl pyridinium halides such as N-cetyl pyridinium bromide, and the like. One suitable type of quaternary ammonium compound includes, for example, those in which the molecules contain amine, ether or ester linkages such as octyl phenoxy ethoxy ethyl dimethyl benzyl ammonium chloride, N-(laurylcocoaminoformylmethyl)-pyridinium chloride, and the like. Another effective type of quaternary ammonium compound include, for example, those in which the hydrophobic radical is characterized by a substituted aromatic nucleus as the case of lauryloxyphenyltrimethyl ammonium chloride, cetylaminophenyltrimethyl ammonium methosulfate, dodecylphenyltrimethyl ammonium methosulfate, dodecylbenzyltrimethylammonium chloride, chlorinated dodecylbenzyltrimethyl ammonium chloride, and the like. Preferably, the quaternary ammonium compound utilized in the practice of the present technology exhibit biocidal activity or are biocidal in nature.

[0038] Particularly useful quaternary ammonium compound germicides include compositions which include a single quaternary compound, as well as mixtures of two or more different quaternary compounds. Such useful quaternary compounds are available under the EMPIGEN, BARDAC, BARQUAT, HYAMINE, LONZABAC, and ONYXIDE trademarks, which are more fully described in, for example, McCutcheon's Functional Materials (Vol. 2), North American Edition, 1998, as well as the respective product literature from the suppliers identified below.

[0039] For example, BARDAC 205M is described to be a liquid containing alkyl dimethyl benzyl ammonium chloride (Benzalkonium chloride, BKC), octyl decyl dimethyl ammonium chloride; didecyl dimethyl ammonium chloride (DDAC), and dioctyl dimethyl ammonium chloride (50% active) (also available as 80% active (BARDAC 208M)); described generally in McCutcheon's as a combination of alkyl dimethyl benzyl ammonium chloride and dialkyl dimethyl ammonium chloride; BARDAC 2050 is described to be a combination of octyl decyl dimethyl ammonium chloridedidecyl dimethyl ammonium chloride, and dioctyl dimethyl ammonium chloride (50% active) (also available as 80% active (BARDAC 2080)); BARDAC 2250 is described to be didecyl dimethyl ammonium chloride (50% active); BARDAC LF (or BARDAC LF-80), described as being based on dioctyl dimethyl ammonium chloride (BARQUAT MB-50, MX-50, OJ-50 (each 50% liquid) and MB-80 or MX-80 (each 80% liquid) are each described as an alkyl dimethyl benzyl ammonium chloride; BARDAC 4250 and BARQUAT 4250 Z (each 50% active) or BARQUAT 4280 and BARQUAT 4280Z (each 80% active) are each described as alkyl dimethyl benzyl ammonium chloride/alkyl dimethyl ethyl benzyl ammonium chloride. Also, HYAMINE 1622, described as diisobutyl phenoxy ethoxy ethyl dimethyl benzyl ammonium chloride (50% solution); HYAMINE 3500 (50% actives), described as alkyl dimethyl benzyl ammonium chloride (also available as 80% active (HYAMINE 3500-80)); and HYMAINE 2389 described as being based on methyl dodecylbenzyl ammonium chloride and/or methyl dodecylxylene-bis-trimethyl ammonium chloride.

[0040] (BARDAC, BARQUAT and HYAMINE are presently commercially available from Lonza, Inc., Fairlawn, N. J.). BTC 50 NF (or BTC 65 NF) is described to be alkyl dimethyl benzyl ammonium chloride (50% active); BTC 99 is described as didecyl dimethyl ammonium chloride (50% active); BTC 776 is described to be myrisalkonium chloride (50% active); BTC 818 is described as being octyl decyl dimethyl ammonium chloride, didecyl dimethyl ammonium chloride, and dioctyl dimethyl ammonium chloride (50% active) (available also as 80% active (BTC 818-80%)); BTC 824 and BTC 835 are each described as being of alkyl dimethyl benzyl ammonium chloride (each 50% active); BTC 885 is described as a combination of BTC 835 and BTC 818 (50% active) (available also as 80% active (BTC 888)); BTC 1010 is described as didecyl dimethyl ammonium chloride (50% active) (also available as 80% active (BTC 1010-80)); BTC 2125 (or BTC 2125 M) is described as alkyl dimethyl benzyl ammonium chloride and alkyl dimethyl ethylbenzyl ammonium chloride (each 50% active) (also available as 80% active (BTC 2125 80 or BTC 2125 M)); BTC 2565 is described as alkyl dimethyl benzyl ammonium chlorides (50% active) (also available as 80% active (BTC 2568)); BTC 8248 (or BTC 8358) is described as alkyl dimethyl benzyl ammonium chloride (80% active) (also available as 90% active (BTC 8249)); ONYXIDE 3300 is described as n-alkyl dimethyl benzyl ammonium saccharinate (95% active). (BTC and ONYXIDE are presently commercially available from Stepan Company, Northfield, Ill). Benzyl-C12-14-alkyldimethylammonium chlorides benzyl C12-C16- alkyl dimethyl chlorides also available as EMPIGEN BAC 50 and EMPIGEN BAC 80. It is an aqueous solution of benzalkonium chloride at ca. 50% or 80% in water respectively. EMPIGEN BAC 50 and EMPIGEN 80 are readily biodegradable, EMPIGEN is commercially available from Innospec Performance Chemicals

[0041] Polymeric quaternary ammonium salts based on these monomeric structures are also considered desirable for the present invention. One example is POLYQUAT, described as being a 2-butenyldimethyl ammonium chloride polymer.

[0042] Preferably the quaternary ammonium compound is selected from alkyl dimethyl benzyl ammonium chloride (BKC), didecyl dimethyl ammonium chloride (DDAC) and combinations thereof.

Water-soluble rheology modifying polymer

[0043] To achieve the desired viscosity, the cleaning composition may comprise 0.01 to 1 wt% water-soluble rheology modifying polymer. Rheology modifying polymers are known and their ability to impart viscosity to a composition may, in part, depend on the presence or absence of other ingredients.

[0044] Water-soluble polymers can be used to thicken the composition which includes non-ionic, cationic and amphoteric polymers. Suitable polymers include hydroxy ethyl cellulose, modified hydroxy ethyl cellulose, guar gum, gum tragacanth, gum arabic, gum acacia, Jaguar® C13S, Jaguar® C14S, Jaguar® C17, Jaguar® HP 105 (hydroxy propyl guar), Jaguar® HP 60 (hydroxylated propylated guar), Jaguar® S (Native guar gum), Carbopol® Aqua CC, Merquat™ 100, Merquat™ 280, Merquat™ 281 and Merquat™ 550 from Lubrizol and poly ethylene glycols such as Polyox™ WSR- 205 (PEG 14), Polyox™ WSR N-60K (PEG 45), and Polyox™ WSR-301 (PEG 90).

[0045] The cleaning composition of the present invention may comprise a quaternary ammonium compound having a cationic nature, therefore the polymer preferably is a non-ionic water-soluble polymer, more preferably a hydroxy cellulose based polymer. Preferred polymers are hydrophobically modified hydroxyethyl celluloses. An example of a suitable polymer is PolySurf™ 67 CS, i.e. cetyl hydroxyethylcellulose.

Further surfactants

[0046] The cleaning composition may comprise further surfactant in addition to the ethoxylated amine.

Amphoteric surfactant

[0047] The composition may comprise 0.1 to 5 wt% amphoteric surfactant, like for example 0.2 to 4 wt%. Preferably, when present, the amount of amphoteric surfactant is 0.3 to 3 wt% and more preferably 0.5 to 2 wt%. Suitable amphoteric surfactants include amine oxide and betaine.

Amine oxide

[0048] Preferred amine oxides are alkyl dimethyl amine oxide and alkyl amido propyl dimethyl amine oxide, more preferably alkyl dimethyl amine oxide. Especially preferred are lauryl dimethylamine oxide, coco dimethyl amine oxide and coco amido propyl dimethyl amine oxide.

Betaine

[0049] Preferably the amphoteric surfactant is a betaine. Suitable betaines include alkyl betaine, alkyl amido betaine, alkyl amidopropyl betaine, alkyl sulphobetaine and alkyl phosphobetaine, wherein the alkyl groups preferably have from 8 to 19 carbon atoms.

[0050] Examples include cocodimethyl sulphopropyl betaine, cetyl betaine, laurylamidopropyl betaine, caprylate/caprate betaine, capryl/capramidopropyl betaine, cocamidopropyl hydroxysultaine, cocobutyramido hydroxysultaine, and preferably lauryl betaine, cocamidopropyl betaine and sodium cocamphopropionate. Preferably the betaine is cocamidopropyl betaine (CAPB).

Non-ionic surfactant

[0051] The composition may comprise 0.01 to 3 wt% further non-ionic surfactant. Preferably, when present, the amount of further non-ionic surfactant is 0.2 to 2 wt% and more preferably 0.3 to 1.5 wt%.

Alcohol ethoxylate

[0052] If present, the further non-ionic surfactant, preferably is an alcohol ethoxylate. Suitable alcohol ethoxylate surfactants include the condensation products of a higher alcohol (e.g. an alkanol containing about 8 to 18 carbon atoms in a straight or branched chain configuration) condensed with about 5 to 30 moles of ethylene oxide, for example, lauryl or myristyl alcohol condensed with about 16 moles of ethylene oxide (EO), tridecanol condensed with about 6 moles of EO, myristyl alcohol condensed with about 10 moles of EO per mole of myristyl alcohol, the condensation product of EO with a cut of coconut fatty alcohol containing a mixture of fatty alcohols with alkyl chains varying from 10 to about

14 carbon atoms in length and wherein the condensate contains either about 6 moles of EO per mole of total alcohol or about 9 moles of EO per mole of alcohol and tallow alcohol ethoxylates containing 6 EO to 11 EO per mole of alcohol. Particularly preferred is Lauryl alcohol condensed with 5, 7 and 9 moles of ethylene oxide (Laureth 5, Laureth 7 and Laureth 9). Preferably, the alcohol ethoxylate surfactant is selected from Laureth 5, Laureth 7 and Laureth 9, or mixtures thereof.

[0053] Condensates of 2 to 30 moles of ethylene oxide with sorbitan mono- and tri-C10-C20 alkanolic acid esters having a HLB of 10 to 15 also may be employed as the nonionic surfactant. These surfactants are well known and are available from Imperial Chemical Industries under the Tween trade name. Suitable surfactants include polyoxyethylene (4) sorbitan monolaurate, polyoxyethylene (4) sorbitan monostearate, polyoxyethylene (20) sorbitan trioleate and polyoxyethylene (20) sorbitan tristearate.

Anionic surfactants

[0054] Preferably the cleaning composition is free from anionic surfactant as these may interfere with the biocidal action of the quaternary ammonium compound.

Further ingredients

[0055] The cleaning composition may comprise further ingredients like fragrance and hydrotropes. To enhance the environmental profile of the cleaning composition it is preferred that the composition is free from organic solvents like alcohol-based solvents, ether-based solvents and ester-based solvents.

Product format

[0056] The composition may be packaged in the form of any commercially available bottle for storing the liquid. The bottle containing the liquid can be of different sizes and shapes to accommodate different volumes of the liquid; preferably between 0.25 and 5 L, more preferably between 0.25 and 1.5 L or even between 0.25 and 1 L. The bottle is preferably provided with a dispenser, which enables the consumer an easier mode of dispersion of the liquid. Foam, spray or pump-dispensers may also be used.

Method

[0057] The invention also relates to a method of cleaning a toilet comprising the step of:

- a. contacting at least part of the toilet surface with the composition according to the invention; and
- b. optionally rinsing the surface with water.

[0058] The composition may be used to clean any suitable hard surface including toilet surfaces, inside and outside the toilet bowl, and other bathroom and kitchen surfaces. The composition of the invention is applied onto a hard surface in neat or diluted form. The composition may be applied by any known ways such as by using a cleaning implement, such as scrub, sponge paper, cloth, wipes or any other direct or indirect application. The applied composition may be cleaned using a cleaning implement such as a scrub, sponge, paper, cloth or wipes with or without water, or rinsed off with water, optionally running water.

Use

[0059] The invention further relates to the use of an ethoxylated amine with a C12 to 22 unsaturated alkyl group and 1 to 50 ethoxylate groups to stabilize water-soluble organic dye in a composition of the present invention.

[0060] The invention will now be illustrated by means of the following non-limiting examples.

Examples

[0061] Aqueous formulations 1 and A were prepared according to the compositions in Table 1.

TABLE 1 (wt%)

Ingredients	1	A
Micro Treated Demin Water	To 100	To 100

(continued)

Ingredients	1	A
Benzalkonium chloride	0,300	0,300
Oleyl amine 2EO	0,650	-
Coco/tallow amine 2EO	-	0,650
Citric acid	3,000	3,000
H ₂ O ₂	1,000	1,000
Cellulose hydroxyethyl ether	0,350	0,350
Dequest 2010	0,150	0,150
SCS	0,250	0,250
Fragrance	0,130	0,130
Dye CI 42090 (Brilliant Blue FCF)	0,000175	0,000175
Sodium Hydroxide	0,020	0,020
Demin water	To 100	To 100
	pH 2,3	pH 2,3

[0062] The formulation was poured into a transparent beaker glass and placed before a light background. The colour intensity of the prepared formulation was assessed visually (t=0).

[0063] The formulations were stored in a closed container under low light conditions for 2 months at 37 degrees Celsius after which the colour intensity was assessed again as described above (t=2 months). Formulation 1 had the same colour intensity as at t=0. Formulation A was several shades lighter compared to the colour intensity at t=0 indicating degradation of the colorant.

Claims

1. Liquid aqueous coloured cleaning composition comprising

- 0.5 to 4 wt% hydrogen peroxide;
- 0.1 to 5 wt% ethoxylated amine with a C12 to 22 unsaturated alkyl group and 1 to 50 ethoxylate groups;
- Water-soluble organic dye;
- 0.25 to 5 wt% organic acid having a pK_a of from 1 to 5.5;

wherein the composition optionally comprises ethoxylated amine with a saturated alkyl group and the weight ratio of ethoxylated amine with an unsaturated alkyl group to ethoxylated amine with a saturated alkyl group is at least 1:1; and wherein the composition has a pH of 2 to 5 and a viscosity at 25°C of 1 to 1000 mPa.s @ 20 s⁻¹.

- Composition according to claim 1 comprising 0.2 to 4 wt% ethoxylated amine, preferably 0.3 to 3 wt%, more preferably 0.4 to 2 wt% and even more preferably 0.5 to 1 wt%.
- The composition according to claim 1 or 2 wherein the ethoxylated amine comprises a C16 to 20 unsaturated alkyl group and 1 to 15 ethoxylate groups.
- The composition according to claim 1 or 2 wherein the ethoxylated amine is PEG-2-oleyl amine.
- Composition according to any one of claims 1 to 4 wherein the organic acid has a pK_a of 2 to 4.8 and preferably 3 to 4.
- Composition according to any one of claims 1 to 5 wherein the organic acid is selected from citric acid, lactic acid, acetic acid, malonic acid, adipic acid, glutaric acid, glycolic acid, maleic acid and combinations thereof, preferably citric acid, lactic acid, glycolic acid and combinations thereof.

7. Composition according to any one of claims 1 to 6 wherein the composition has a pH of 2 to 4, preferably 2 to 3.
8. Composition according to any one of claims 1 to 7 wherein the composition has a viscosity of 100 to 700 mPa.s @ 20 s⁻¹, preferably 200 to 600 mPa.s @ 20 s⁻¹.
9. Composition according to any one of claims 1 to 8 further comprising 0.05 to 3 wt% one or more quaternary ammonium compound.
10. Composition according to claim 9 wherein the quaternary ammonium compound is alkyl dimethyl benzyl ammonium chloride (BKC), didecyl dimethyl ammonium chloride (DDAC) and combinations thereof.
11. Composition according to any one of claims 1 to 10 further comprising 0.01 to 1 wt% water-soluble rheology modifying polymer.
12. Composition according to claim 11 wherein the polymer is a non-ionic water-soluble polymer, preferably a hydrophobically modified hydroxyethyl cellulose.
13. Cleaning composition according to any one of claims 1 to 12 wherein the composition is a transparent liquid.
14. Method of cleaning a toilet comprising the step of:
 - a. contacting at least part of the toilet surface with the composition according to any one of claims 1 to 13; and
 - b. optionally rinsing the surface with water.
15. Use of an ethoxylated amine with a C12 to 22 unsaturated alkyl group and 1 to 50 ethoxylate groups to stabilize water-soluble organic dye in a composition according to any one of claims 1 to 13.



EUROPEAN SEARCH REPORT

Application Number

EP 22 15 1512

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Place of search			Examiner
The Hague			Placke, Daniel
Date of completion of the search			
23 May 2022			
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X : particularly relevant if taken alone			T : theory or principle underlying the invention
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