

Description

Title of the Invention: STERILIZING DETERGENT COMPOSITION FOR
HARD SURFACES

Field of the Invention

[0001]

The present invention relates to a sterilizing detergent composition for hard surfaces.

Background of the Invention

[0002]

In residential environmental facilities surrounding people, there are various hard surfaces made of a material such as tiles, plastics and metals, and these hard surfaces are exposed to an environment where various stains adhere in living situations. Among others, hard surfaces used in a bathroom and a kitchen, and as a floor are surfaces with which people ordinarily come into contact, a large amount of stains are thus likely to remain and accumulate, and in addition, such stains have properties of being difficult to remove by washing.

[0003]

In general, for a detergent for hard surfaces, a composition suitable for each stain is used in order to remove different stains of a bathroom, a kitchen, a floor, and the

like which are to be treated. For example, as a kitchen detergent which is used for the kitchen equipment such as a range, an oven, walls and floors surrounding a range, and an extractor fan, detergents containing a surfactant, a solvent, an alkaline agent, and the like are used for removing oil stains which are deteriorated by the action of heat, sunlight, oxygen in the air, or the like. In addition, as a bathroom detergent which is used in a bathroom such as for a bathtub, and walls and floors of a bathroom, a detergent containing a surfactant, a solvent, a sequestering agent, and the like is used for removing stains of metallic soap, in particular, a calcium salt of a fatty acid.

[0004]

In washing hard surfaces in a toilet, a bathroom, a kitchen, and the like, it is desired to attain not only detergency but also superior sterilizing property. For this purpose, a sterilizing component is incorporated in a detergent for hard surfaces.

[0005]

JP-A 2012-255073 discloses a liquid detergent composition for hard surfaces containing a cation surfactant, an amphoteric surfactant, and a specific organic compound such as benzyl alcohol in a given condition, the liquid detergent being capable of effectively removing stains having a pink and/or red color generated in a bathroom and the like.

[0006]

JP-A 2004-523616 discloses a low residue, antimicrobial cleaning composition containing a specific organocarboxylic acid and a sparingly soluble monohydric solvent selected from aliphatic alcohols and glycol ethers in a given condition.

[0007]

JP-A 2002-511391 discloses a liquid disinfecting composition including effective amounts of a disinfecting substance and a specific poly(alkylene glycol) alkyl ether.

[0008]

JP-A 2009-120549 discloses a pesticidal composition including a specific emulsion stabilizer, 2-(thiazol-4-in)benzimidazole, a mixed solvent containing a glycol-based solvent and benzyl alcohol, and a surfactant.

[0009]

JP-A 8-199189 discloses a detergent composition for bathroom. JP-A 7-3288 discloses a detergent composition for hard surfaces. JP-A 6-322398 discloses a detergent composition for hard surfaces. EP-A 879047 or WO-A 97/26860 discloses a conditioning shampoo composition.

[0010]

Summary of the Invention

The present invention relates to a sterilizing detergent composition for hard surfaces, containing 0.5% by mass or more

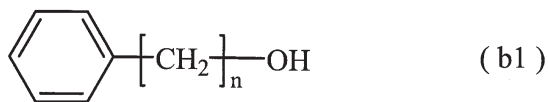
and 3% by mass or less of the following component (a), 0.5% by mass or more and 10% by mass or less of the following component (b), 1% by mass or more and 8% by mass or less of the following component (c), and the following component (d), wherein the ratio of the component (a) in the total of surfactants is 65% by mass or more, and the pH at 25°C is 2 or higher and 6 or lower:

component (a): a betaine amphoteric surfactant;

component (b): a compound represented by the general formula (b1):

[0011]

[Chem. 1]



[0012]

wherein, n represents an integer of 1 or more and 8 or less;

component (c): a chelating agent; and

component (d): water.

[0013]

Furthermore, the present invention provides a use of the composition for washing bathrooms; and a method of sterilizing and washing a hard surface, including washing the hard surface with the above composition, or rinsing the washed hard surface with water.

[0014]

Detailed Description of the Invention

The present invention provides a sterilizing detergent composition for hard surfaces having high detergency against stubborn stains in which soap scum and sebum are combined and having superior sterilizing property.

[0015]

The sterilizing detergent composition for hard surfaces of the present invention has high detergency against stubborn stains in which soap scum and sebum are combined and has superior sterilizing property. Furthermore, the composition is rich in foaming property in use and the foam easily disappears in rinsing.

[0016]

Examples of the betaine amphoteric surfactant of the component (a) in the present invention include alkylcarbobetaine, alkylamide carbobetaine, alkylsulfobetaine, alkylamide sulfobetaine, alkylhydroxysulfobetaine, and alkylamide hydroxysulfobetaine.

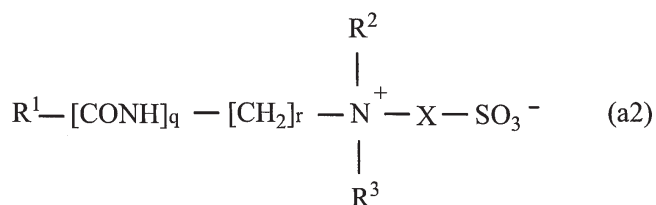
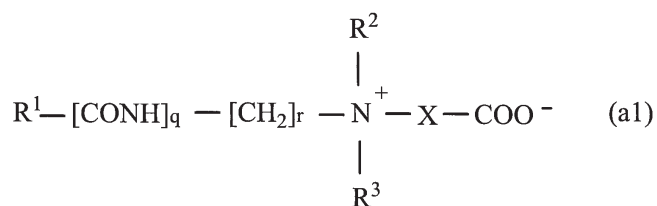
[0017]

The component (a) is preferably one or more kinds selected from a betaine amphoteric surfactant represented by the following general formula (a1) [hereinunder referred to

as component (a1)] and a betaine amphoteric surfactant represented by the following general formula (a2) [hereinunder referred to as component (a2)]:

[0018]

[Chem. 2]



[0019]

wherein, R¹ represents a linear or branched alkyl group or alkenyl group having 5 or more and 18 or less carbon atoms; R² and R³ each represent an alkyl group having 1 or more and 5 or less carbon atoms, optionally substituted with a hydroxy group; X represents a linear or branched alkylene group having 1 or more and 3 or less carbon atoms, optionally substituted with a hydroxy group; q represents an integer of 0 or 1; and r represents an integer of 0 or more and 4 or less.

[0020]

In the general formula (a1) or (a2), R¹ is preferably a linear or branched alkyl group or alkenyl group, more

preferably a linear alkyl group, having preferably 7 or more, more preferably 9 or more, and preferably 17 or less, more preferably 15 or less, further preferably 13 or less carbon atoms.

In the general formula (a1) or (a2), R^2 and R^3 each are preferably an alkyl group having 1 or more and 3 or less carbon atoms, and more preferably a methyl group.

In the general formula (a1), X is preferably an alkylene group having 1 or 2 carbon atoms, optionally substituted with a hydroxy group, and more preferably a methylene group.

In the general formula (a2), X is preferably an alkylene group having 2 or 3 carbon atoms, optionally substituted with a hydroxy group, and more preferably a propylene group or a hydroxypropylene group.

In the general formula (a1), q is preferably 1, and r is preferably 3.

In the general formula (a2), q is preferably 0, and r is preferably 0.

[0021]

The component (a) preferably contains the component (a1). The component (a) may be a combination of the component (a1) and the component (a2). When the component (a1) and the component (a2) are contained as the component (a), the mass ratio of the component (a1) / the component (a2) is preferably 0.5 or more, more preferably 1 or more, and preferably 20 or

less, more preferably 15 or less. The ratio of the component (a1) in the component (a) is preferably 30% by mass or more, more preferably 50% by mass or more.

[0022]

The sterilizing detergent composition of the present invention contains the component (a) in an amount of 0.5% by mass or more, and 3% by mass or less, preferably 2.8% by mass or less, more preferably 2.5% by mass or less. When the content of the component (a) is within the above range, the detergency and the foaming property in use are sufficient, and the foam disappearing property in rinsing is good.

[0023]

The sterilizing detergent composition of the present invention may contain a surfactant other than the component (a), but from the viewpoint of the detergency, the ratio of the component (a) in the total of surfactants is 65% by mass or more, preferably 80% by mass or more, more preferably 90% by mass or more, more preferably 95% by mass or more, more preferably 100% by mass. Incidentally, in the present invention, the surfactants do not include the component (e) described later. In addition, the mass of the total of surfactants means the total mass of the component (a) and the below-described other surfactants than the component (a).

[0024]

Examples of the other surfactant than the component (a)

include an anionic surfactant, a cationic surfactant, and a nonionic surfactant. The main role of the surfactant which is optionally additionally incorporated is to regulate the amount and quality of foam. The other surfactant than the component (a) is, in terms of an effect on the detergency, required to be used in a ratio in the total surfactants of 35% by mass or less, preferably 20% by mass or less, more preferably 10% by mass or less, more preferably 5% by mass or less, more preferably 0% by mass.

The other surfactant than the component (a) is preferably one or more kinds selected from an anionic surfactant, a cationic surfactant, and a nonionic surfactant, more preferably one or more kinds selected from an anionic surfactant and a cationic surfactant, more preferably an anionic surfactant.

[0025]

Examples of the anionic surfactant include an alkylbenzene sulfonate, an alkyl or alkenyl sulfate, a polyoxyalkylene alkyl or alkenyl ether sulfate, an olefin sulfonate, an alkane sulfonate, a fatty acid salt, a polyoxyalkylene alkyl or alkenyl ether carboxylate, an α -olefin fatty acid salt, and an ester thereof.

[0026]

Examples of the cationic surfactant include a quaternary ammonium salt such as a halogenated benzalkonium, a

halogenated benzethonium, a monoalkyltrimethylammonium salt, and a dialkyldimethylammonium salt.

[0027]

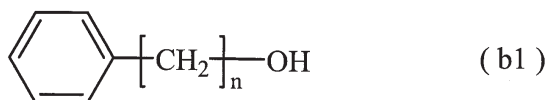
Examples of the nonionic surfactant include a polyoxyalkylene alkyl or alkenyl ether, an alkyl polyglycoside, an alkyl dimethyl amine oxide, an alkylamidepropyl dimethyl amine oxide, a polyoxyethylene-polyoxypropylene block copolymer, a sucrose fatty acid ester, a sorbitan fatty acid ester, and a polyoxyethylene sorbitan fatty acid ester.

[0028]

The component (b) is a compound represented by the general formula (b1):

[0029]

[Chem. 3]



[0030]

wherein, n represents an integer of 1 or more and 8 or less.

In the general formula (b1), n is preferably 1 or 2, more preferably 1. Accordingly, the component (b) is preferably a compound selected from benzyl alcohol and phenethyl alcohol.

[0031]

The sterilizing detergent composition of the present invention contains the component (b) in an amount of 0.5% by

mass or more, preferably 0.8% by mass or more, more preferably 1% by mass or more, and 10% by mass or less, preferably 5% by mass or less, more preferably 3% by mass or less. When the content of the component (b) is the lower limit or more, both the detergency and the sterilizing property are exhibited, and when the content is the upper limit or less, the solution is not separated and a stable one-phase solution state can be kept.

[0032]

The chelating agent of the component (c) of the present invention is not particularly limited, and examples thereof include one or more of the compounds shown in the following (1) to (5).

[0033]

(1) A phosphate compound such as orthophosphoric acid, pyrophosphoric acid, tripolyphosphoric acid, methaphosphoric acid, hexamethaphosphoric acid, and phytic acid, and an alkali metal salt, ammonium salt or alkanolamine salt thereof.

(2) A phosphonic acid such as ethane-1,1-diphosphonic acid, ethane-1,1,2-triphosphonic acid, ethane-1-hydroxy-1,1-diphosphonic acid and a derivative thereof, ethanehydroxy-1,1,2-triphosphonic acid, ethane-1,2-dicarboxy-1,2-diphosphonic acid, and methanehydroxyphosphonic acid, and an alkali metal salt, ammonium salt or alkanol amine salt thereof.

(3) An aminopolyacetic acid such as nitrilotriacetic acid,

iminodiacetic acid, ethylenediaminetetraacetic acid, hydroxyethylenediamineacetic acid, diethylenetriaminepentaacetic acid, glycoletherdiaminetetraacetic acid, hydroxyethyliminodiacetic acid, triethylenetetraminehexaacetic acid and Djenkolic acid, and an alkali metal salt, ammonium salt or alkanolamine salt thereof.

(4) A compound such as citric acid, lactic acid, tartaric acid, oxalic acid, malic acid, gluconic acid, diglycolic acid, oxydisuccinic acid, carboxymethylsuccinic acid, carboxymethyloxysuccinic acid and carboxymethyltartaric acid, and an alkali metal salt, ammonium salt or alkanolamine salt thereof.

(5) Aminopoly(methylenephosphonic acid) and polyethylenepolyamine poly(methylenephosphonic acid), and an alkali metal salt, ammonium salt or alkanolamine salt thereof.

[0034]

Among the above chelating agents, preferred are a hydroxycarboxylic acid such as citric acid and malic acid, a condensed phosphoric acid such as pyrophosphoric acid, an aminocarboxylic acid such as ethylenediaminetetraacetic acid, and a salt, preferably an alkali metal salt, ammonium salt or alkanolamine salt thereof, more preferred are a hydroxycarboxylic acid such as citric acid and malic acid, and

a salt, preferably an alkali metal salt, ammonium salt or alkanolamine salt thereof.

[0035]

The sterilizing detergent composition of the present invention contains the component (c) in an amount of 1% by mass or more, preferably 1.5% by mass or more, more preferably 2% by mass or more, and 8% by mass or less, preferably 6% by mass or less. When the content of the component (c) is within the range, a superior detergency can be obtained.

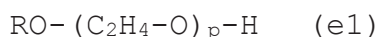
[0036]

The sterilizing detergent composition of the present invention contains water of the component (d) in an amount of preferably 80% by mass or more, more preferably 85% by mass or more, and preferably 95% by mass or less, more preferably 93% by mass or less.

[0037]

The sterilizing detergent composition of the present invention preferably contains, from the viewpoint of obtaining better detergency, a component (e) described below in an amount of 0.01% by mass or more and 10% by mass or less:

component (e): a compound represented by the general formula (e1):



wherein, R is an aliphatic hydrocarbon group having 3 or more and 8 or less carbon atoms, or a cyclic hydrocarbon group having

3 or more and 8 or less carbon atoms; and p is an integer of 1 or more and 8 or less.

[0038]

In the general formula (e1), R is preferably an alkyl group having 1 or more, preferably 2 or more, more preferably 3 or more, and 8 or less, preferably 6 or less, more preferably 5 or less carbon atoms. In addition, the alkyl group is preferably a linear alkyl group. In the general formula (e1), p is 1 or more, preferably 2 or more, and 8 or less, preferably 6 or less.

[0039]

The component (e) is preferably one or more kinds selected from ethyleneglycol monobutyl ether, diethyleneglycol monobutyl ether, triethyleneglycol monobutyl ether, ethyleneglycol monoisobutyl ether, diethyleneglycol monoisobutyl ether, diethyleneglycol monophenyl ether, pentaethyleneglycol monophenyl ether, hexaethyleneglycol monophenyl ether, ethyleneglycol monobenzyl ether, and diethyleneglycol monobenzyl ether, more preferably one or more kinds selected from ethyleneglycol monobutyl ether, diethyleneglycol monobutyl ether, and ethyleneglycol monobenzyl ether, more preferably diethyleneglycol monobutyl ether.

[0040]

The sterilizing detergent composition of the present

invention contains the component (e) in an amount of preferably 0.01% by mass or more, more preferably 1% by mass or more, further preferably 2% by mass or more, furthermore preferably 3% by mass or more, furthermore preferably 4% by mass or more, and preferably 10% by mass or less, more preferably 8% by mass or less. When the content of the component (e) is within the above range, a better detergency can be obtained.

[0041]

When the sterilizing detergent composition of the present invention contains the component (e), the total content of the component (b) and the component (e) is preferably 2.5% by mass or more, more preferably 3% by mass or more, more preferably 4% by mass or more, more preferably 5% by mass or more, and preferably 20% by mass or less, more preferably 10% by mass or less, more preferably 8% by mass or less, more preferably 6% by mass or less. In addition, the mass ratio (b)/(e) of the component (b) to the component (e) is preferably 25/500 or more, more preferably 50/500 or more, more preferably 100/500 or more, and preferably 500/1 or less, more preferably 500/5 or less, more preferably 500/50 or less, more preferably 500/100 or less, more preferably 500/300 or less, more preferably 500/500 or less.

[0042]

The pH of the sterilizing detergent composition of the present invention at 25°C is 2 or higher, preferably 4 or higher,

and 6 or lower, preferably 5.8 or lower, more preferably 5.5 or lower. When the pH of the undiluted solution is 4 or higher, skin irritation is small, and when the pH is 6 or lower, the detergency is superior.

[0043]

The sterilizing detergent composition of the present invention preferably has a viscosity at 25°C of 1 mPa·s or higher and 6 mPa·s or lower. The viscosity is measured using a Brookfield rotational viscometer with a rotor of No. 1 at 60 rpm as a value after 1 minute.

[0044]

In the sterilizing detergent composition of the present invention, as a viscosity modifier, montmorillonite, hectorite, permiculite, attapulgite, and sepiolite which are known as a swelling clay minerals, and a smectite clay mineral mainly containing a mixture thereof, polyvinyl alcohol, hydroxyethyl cellulose and a derivative thereof, hydroxypropyl cellulose and a derivative thereof, and a methyl cellulose and a derivative thereof may be incorporated.

[0045]

In the sterilizing detergent composition of the present invention, for the purpose of increasing the added value of the product, a fragrance, a coloring matter, a preservative, an antioxidant, and the like may be optionally incorporated.

[0046]

The sterilizing detergent composition of the present invention is suitably used for washing hard surfaces of a bathroom, a bathtub, a washbowl, a tile, a powder room, a washstand, a mirror, a sink in a kitchen, a counter top and a water system. The composition is suitably used for bathrooms. Here, a detergent composition for bathroom is directed to not only bathrooms but also other articles having a hard surface which is present in a bathroom, such as a bathtub and a washbowl.

[0047]

According to the present invention, a method of sterilizing and washing a hard surface, including washing the hard surface with the sterilizing detergent composition for hard surfaces of the present invention, and rinsing the washed hard surface with water. In the present invention, a hard surface can be washed after the sterilizing detergent composition for hard surfaces of the present invention is sprayed on the hard surface. In addition, in the present invention, a hard surface can be washed with a cleaning article having the sterilizing detergent composition for hard surfaces of the present invention carried on a base material.

[0048]

As an example, a method of sterilizing and washing a hard surface, including applying the sterilizing detergent composition for hard surfaces of the present invention on a hard surface, and then performing wiping-off-washing. In the

wiping-off-washing, the composition applied on the hard surface is preferably removed from the hard surface using dishcloth, floorcloth, or nonwoven fabric.

[0049]

The sterilizing detergent composition for hard surfaces of the present invention can be used in a cleaning article having a base material impregnated with the composition. The cleaning article having a base material impregnated with the sterilizing detergent composition for hard surfaces of the present invention is preferred from the viewpoint of the working efficiency of the cleaning operation.

[0050]

As the base material for use in the cleaning article impregnated with the sterilizing detergent composition for hard surfaces is a material which has flexibility, can be impregnated with the sterilizing detergent composition for hard surfaces, has a sufficient strength during use, and does not produce scraps and the like. A base material which can impregnated with the sterilizing detergent composition for hard surfaces in an amount described later under a no-load condition is preferably used.

[0051]

Examples of such a base material include a fibrous structure formed of a fibrous material, for example, various kinds of paper, nonwoven fabric, woven fabric, and knitted

fabric. Examples of the fibrous material forming the fibrous structure include a cellulose fiber, a modified cellulose fiber, a synthesized fiber and a mixture of two or more thereof.

[0052]

A porous structure obtained by dispersing air bubbles in a resin (for example, a sponge structure) may also be used as the base material.

[0053]

The method of sterilizing and washing a hard surface in which the hard surface is wiped using a cleaning article impregnated with the sterilizing detergent composition for hard surfaces of the present invention is, from the view point of the working efficiency of the cleaning operation, preferable for a light sterilization and washing of a hard surface. The cleaning article impregnated with the sterilizing detergent composition for hard surfaces may be either of an article having a base material previously impregnated with the sterilizing detergent composition, or an article in which a dried base material is impregnated with the sterilizing detergent composition for hard surfaces immediately before use through spraying or other method. The surface to be cleaned may also be cleaned using a cleaning article onto which a composition has been sprayed. The cleaning article impregnated with the sterilizing detergent composition for hard surfaces may be attached to a cleaning

tool of a mop shape, or may be used for wipe-cleaning by directly grasping the article with hand.

[0054]

In the case where the base material is previously impregnated with the sterilizing detergent composition for hard surfaces, the ratio of impregnation with the sterilizing detergent composition for hard surfaces is, from the viewpoint of the cleaning efficiency, on the basis of the mass of the base material [that is, on the basis of the base material in a non-impregnated state (a dry state)], preferably 100% by mass or more, more preferably 150% by mass or more, and preferably 1000% by mass or less, more preferably 400% by mass or less, further preferably 350% by mass or less. When the ratio of impregnation is 100% by mass or more, a sufficient cleaning performance against stains or dust can be attained. When it is 1000% by mass or less, an amount of releasing the sterilizing detergent composition for hard surfaces onto the surface to be cleaned is appropriate and stains and dust do not remain on the surface to be cleaned, and the detergent composition can be used without any effect on the surface to be cleaned made of various materials such as wood-based material. In terms of further enhancement of cleaning efficiency, when the base material is a sheet, the basis weight before impregnation with the sterilizing detergent composition for hard surfaces is, from the viewpoint of holding the sterilizing detergent

composition for hard surfaces required for sterilizing and washing a given area, and the operation efficiency and the cost of the sheet, preferably 40 g/m² or more, more preferably 50 g/m² or more, and preferably 200 g/m² or less, more preferably 150 g/m² or less.

[0055]

During use of the cleaning article impregnated with the sterilizing detergent composition for hard surfaces, the sterilizing detergent composition for hard surfaces of the present invention may be separately used while spraying the composition on the object to be cleaned or the cleaning article. By such a use method, a wider area can be cleaned.

[0056]

<Embodiment of the present invention>

Embodiments of the present invention are shown below.

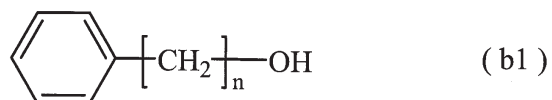
<1> A sterilizing detergent composition for hard surfaces, containing 0.5% by mass or more and 3% by mass or less of the following component (a), 0.5% by mass or more and 10% by mass or less of the following component (b), 1% by mass or more and 8% by mass or less of the following component (c), and the following component (d), wherein the ratio of the component (a) in the total of surfactants is 65% by mass or more, and the pH at 25°C is 2 or higher and 6 or lower:

component (a): a betaine amphoteric surfactant;

component (b): a compound represented by the general formula (b1):

[0057]

[Chem. 4]



[0058]

wherein, n represents an integer of 1 or more and 8 or less;

component (c): a chelating agent; and

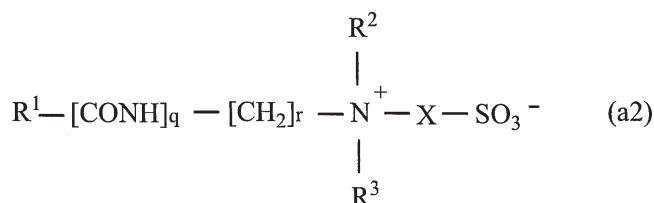
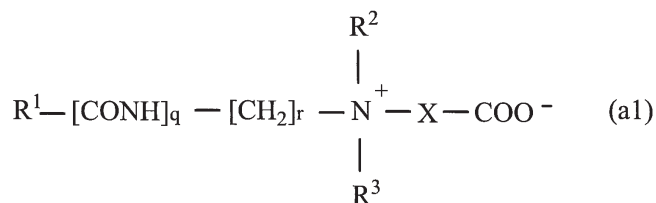
component (d): water.

[0059]

<2> The sterilizing detergent composition for hard surfaces according to <1>, wherein the component (a) is one or more kinds selected from a betaine amphoteric surfactant represented by the following general formula (a1) and a betaine amphoteric surfactant represented by the following general formula (a2):

[0060]

[Chem. 5]



[0061]

wherein, R¹ represents a linear or branched alkyl group or alkenyl group having 5 or more and 18 or less carbon atoms; R² and R³ each represent an alkyl group having 1 or more and 5 or less carbon atoms, optionally substituted with a hydroxy group; X represents a linear or branched alkylene group having 1 or more and 3 or less carbon atoms, optionally substituted with a hydroxy group; q represents an integer of 0 or 1; and r represents an integer of 0 or more and 4 or less.

[0062]

<3> The sterilizing detergent composition for hard surfaces according to <2>, wherein in the general formula (a1) or (a2), R¹ is a linear or branched alkyl group or alkenyl group, more preferably a linear alkyl group, having preferably 7 or more, more preferably 9 or more, and preferably 17 or less, more preferably 15 or less, further preferably 13 or less carbon atoms.

[0063]

<4> The sterilizing detergent composition for hard surfaces according to <2> or <3>, wherein in the general formula (a1) or (a2), R^2 and R^3 are each an alkyl group having preferably 1 or more and 3 or less carbon atoms, more preferably a methyl group.

[0064]

<5> The sterilizing detergent composition for hard surfaces according to any one of <2> to <4>, wherein in the general formula (a1), X is preferably an alkylene group having 1 or 2 carbon atoms, optionally substituted with a hydroxy group, more preferably a methylene group.

[0065]

<6> The sterilizing detergent composition for hard surfaces according to any one of <2> to <5>, wherein in the general formula (a2), X is preferably an alkylene group having 2 or 3 carbon atoms, optionally substituted with a hydroxy group, more preferably a propylene group or a hydroxypropylene group.

[0066]

<7> The sterilizing detergent composition for hard surfaces according to any one of <2> to <6>, wherein in the general formula (a1), q is preferably 1, and r is preferably 3.

[0067]

<8> The sterilizing detergent composition for hard surfaces according to any one of <2> to <7>, wherein in the general

formula (a2), q is preferably 0, and r is preferably 0.

[0068]

<9> The sterilizing detergent composition for hard surfaces according to any one of <1> to <8>, wherein the component (a) is contained in an amount of 0.5% by mass or more and 3% by mass or less, preferably 2.8% by mass or less, more preferably 2.5% by mass or less, more preferably 2% by mass or less, more preferably 1.8% by mass or less, more preferably 1.5% by mass or less.

[0069]

<10> The sterilizing detergent composition for hard surfaces according to any one of <1> to <9>, wherein the ratio of the component (a) in the total of surfactants is 65% by mass or more, preferably 80% by mass or more, more preferably 90% by mass or more, more preferably 95% by mass or more, more preferably 100% by mass.

[0070]

<11> The sterilizing detergent composition for hard surfaces according to any one of <1> to <10>, which contains, as a surfactant other than the component (a), preferably one or more kinds selected from an anionic surfactant, a cationic surfactant, and a nonionic surfactant, more preferably one or more kinds selected from an anionic surfactant and a cationic surfactant, more preferably an anionic surfactant.

[0071]

<12> The sterilizing detergent composition for hard surfaces according to any one of <1> to <11>, wherein the ratio of a surfactant other than the component (a) in the total of surfactants is 35% by mass or less, preferably 20% by mass or less, more preferably 10% by mass or less, more preferably 5% by mass or less, more preferably 0% by mass.

[0072]

<13> The sterilizing detergent composition for hard surfaces according to any one of <1> to <12>, wherein the component (b) is a compound selected from benzyl alcohol and phenethyl alcohol.

[0073]

<14> The sterilizing detergent composition for hard surfaces according to any one of <1> to <13>, wherein the component (b) is contained in an amount of 0.5% by mass or more, preferably 0.8% by mass or more, more preferably 1% by mass or more, and 10% by mass or less, preferably 5% by mass or less, more preferably 3% by mass or less.

[0074]

<15> The sterilizing detergent composition for hard surfaces according to any one of <1> to <14>, wherein the component (c) is preferably a chelating agent selected from a hydroxycarboxylic acid selected from citric acid and malic acid, a condensed phosphoric acid selected from pyrophosphoric acid, an aminocarboxylic acid selected from

ethylenediaminetetraacetic acid, and a salt, preferably an alkali metal salt, an ammonium salt or an alkanol amine salt thereof, more preferably a hydroxycarboxylic acid selected from citric acid and malic acid, and a salt, preferably an alkali metal salt, an ammonium salt or an alkanol amine salt thereof.

[0075]

<16> The sterilizing detergent composition for hard surfaces according to any one of <1> to <15>, wherein the component (c) is contained in an amount of 1% by mass or more, preferably 1.5% by mass or more, more preferably 2% by mass or more, and 8% by mass or less, preferably 6% by mass or less.

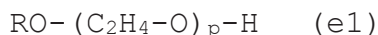
[0076]

<17> The sterilizing detergent composition for hard surfaces according to any one of <1> to <16>, wherein the component (d) is contained in an amount of preferably 80% by mass or more, more preferably 85% by mass or more, and preferably 95% by mass or less, more preferably 93% by mass or less.

[0077]

<18> The sterilizing detergent composition for hard surfaces according to any one of <1> to <17>, which contains a component (e) described below in an amount of 0.01% by mass or more and 10% by mass or less:

component (e): a compound represented by the general formula (e1):



wherein, R is an aliphatic hydrocarbon group having 3 or more and 8 or less carbon atoms or a cyclic hydrocarbon group having 3 or more and 8 or less carbon atoms, and p is an integer of 1 or more and 8 or less.

[0078]

<19> The sterilizing detergent composition for hard surfaces according to <18>, wherein the component (e) is preferably one or more kinds selected from ethyleneglycol monobutyl ether, diethyleneglycol monobutyl ether, triethyleneglycol monobutyl ether, ethyleneglycol monoisobutyl ether, diethyleneglycol monoisobutyl ether, diethyleneglycol monophenyl ether, pentaethyleneglycol monophenyl ether, hexaethyleneglycol monophenyl ether, ethyleneglycol monobenzyl ether, and diethyleneglycol monobenzyl ether, more preferably one or more kinds selected from ethyleneglycol monobutyl ether, diethyleneglycol monobutyl ether, and ethyleneglycol monobenzyl ether, further preferably diethyleneglycol monobutyl ether.

[0079]

<20> The sterilizing detergent composition for hard surfaces according to <18> or <19>, wherein the component (e) is contained in an amount of preferably 0.01% by mass or more, more preferably 1% by mass or more, further preferably 2% by mass or more, furthermore preferably 3% by mass or more,

furthermore preferably 4% by mass or more, and preferably 10% by mass or less, more preferably 8% by mass or less.

[0080]

<21> The sterilizing detergent composition for hard surfaces according to any one of <18> to <20>, wherein the total content of the component (b) and the component (e) is 2.5% by mass or more, preferably 3% by mass or more, more preferably 4% by mass or more, more preferably 5% by mass or more, and preferably 20% by mass or less, more preferably 10% by mass or less, more preferably 8% by mass or less, more preferably 6% by mass or less, and the mass ratio (b)/(e) of the component (b) to the component (e) is preferably 25/500 or more, more preferably 50/500 or more, more preferably 100/500 or more, and preferably 500/1 or less, more preferably 500/5 or less, more preferably 500/50 or less, more preferably 500/100 or less, more preferably 500/300 or less, more preferably 500/500 or less, more preferably 400/500 or less, more preferably 300/500 or less, more preferably 200/500 or less.

[0081]

<22> The sterilizing detergent composition for hard surfaces according to any one of <1> to <21>, wherein the pH at 25°C is 2 or higher, preferably 3 or higher, more preferably 4 or higher, more preferably 4.5 or higher, more preferably 5 or higher, and 6 or lower, preferably 5.8 or lower, more preferably 5.6 or lower, more preferably 5.5 or lower.

[0082]

<23> The sterilizing detergent composition for hard surfaces according to any one of <1> to <22>, which is for bathrooms.

[0083]

<24> A method of sterilizing and washing a hard surface, including washing the hard surface with the sterilizing detergent composition for hard surfaces according to any one of <1> to <23>, and rinsing the washed hard surface with water.

[0084]

<25> The method of sterilizing and washing a hard surface according to <22>, wherein after the sterilizing detergent composition for hard surfaces according to any one of <1> to <23> is sprayed on the hard surface, the hard surface is washed.

[0085]

<26> The method of sterilizing and washing a hard surface according to <22>, wherein the hard surface is washed with a cleaning article having the sterilizing detergent composition for hard surfaces according to any one of <1> to <23> carried on a base material.

[0086]

<1A> A sterilizing detergent composition for hard surfaces, containing 0.5% by mass or more and 3% by mass or less of the following component (a), 0.5% by mass or more and 10% by mass or less of the following component (b), 1% by mass or more and 8% by mass or less of the following component (c), and the

following component (d),

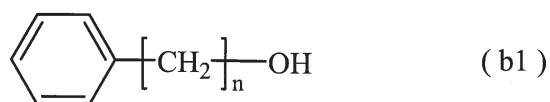
wherein the ratio of the component (a) in the total of surfactants is 65% by mass or more, and

the pH at 25°C is 2 or higher and 6 or lower:

component (a): a betaine amphoteric surfactant;

component (b): a compound represented by the general

formula (b1):



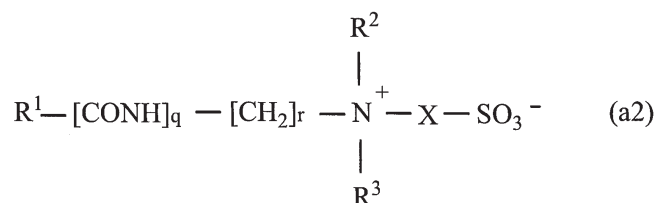
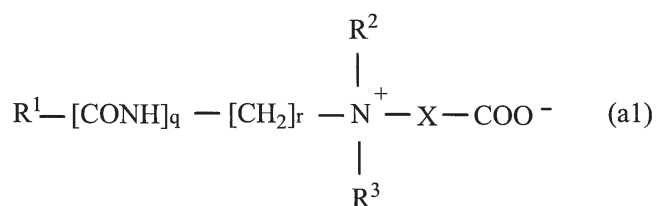
wherein, n represents an integer of 1 or more and 8 or less;

component (c): a chelating agent; and

component (d): water.

[0087]

<2A> The sterilizing detergent composition for hard surfaces according to <1A>, wherein the component (a) is one or more kinds selected from a betaine amphoteric surfactant represented by the following general formula (a1) and a betaine amphoteric surfactant represented by the following general formula (a2):



wherein, R¹ represents a linear or branched alkyl group or alkenyl group having 5 or more and 18 or less carbon atoms; R² and R³ each represent an alkyl group having 1 or more and 5 or less carbon atoms, optionally substituted with a hydroxy group; X represents a linear or branched alkylene group having 1 or more and 3 or less carbon atoms, optionally substituted with a hydroxy group; q represents an integer of 0 or 1; and r represents an integer of 0 or more and 4 or less.

[0088]

<3A> The sterilizing detergent composition for hard surfaces according to <1A> or <2A>, wherein the component (a) is contained in an amount of 0.5% by mass or more and 2.5% by mass or less.

[0089]

<4A> The sterilizing detergent composition for hard surfaces according to <1A> or <2A>, wherein the component (a) is contained in an amount of 0.5% by mass or more and 1.8% by mass

or less.

[0090]

<5A> The sterilizing detergent composition for hard surfaces according to <1A> or <2A>, wherein the component (a) is contained in an amount of 0.5% by mass or more and 1.5% by mass or less.

[0091]

<6A> The sterilizing detergent composition for hard surfaces according to any one of <1A> to <5A>, wherein the ratio of the component (a) in the total of surfactants is 80% by mass or more.

[0092]

<7A> The sterilizing detergent composition for hard surfaces according to any one of <1A> to <5A>, wherein the ratio of the component (a) in the total of surfactants is 90% by mass or more.

[0093]

<8A> The sterilizing detergent composition for hard surfaces according to any one of <1A> to <5A>, wherein the ratio of the component (a) in the total of surfactants is 95% by mass or more.

[0094]

<9A> The sterilizing detergent composition for hard surfaces according to any one of <1A> to <5A>, wherein the ratio of the component (a) in the total of surfactants is 100% by mass.

[0095]

<10A> The sterilizing detergent composition for hard surfaces according to any one of <1A> to <9A>, which contains, as a surfactant other than the component (a), one or more kinds selected from an anionic surfactant, a cationic surfactant, and a nonionic surfactant.

[0096]

<11A> The sterilizing detergent composition for hard surfaces according to any one of <1A> to <10A>, wherein the ratio of the surfactant other than the component (a) in the total of surfactants is 5% by mass or less.

[0097]

<12A> The sterilizing detergent composition for hard surfaces according to any one of <1A> to <11A>, wherein the component (b) is a compound selected from benzyl alcohol and phenethyl alcohol.

[0098]

<13A> The sterilizing detergent composition for hard surfaces according to any one of <1A> to <12A>, wherein the component (b) is contained in an amount of 0.5% by mass or more and 5% by mass or less.

[0099]

<14A> The sterilizing detergent composition for hard surfaces according to any one of <1A> to <13A>, wherein the chelating agent, the component (c), is a hydroxycarboxylic acid such as

citric acid or malic acid, a condensed phosphoric acid such as pyrophosphoric acid, an aminocarboxylic acid such as ethylenediaminetetraacetic acid, or a salt thereof.

[0100]

<15A> The sterilizing detergent composition for hard surfaces according to any one of <1A> to <14A>, wherein the pH at 25°C is 3 or higher and 5.8 or lower.

[0101]

<16A> The sterilizing detergent composition for hard surfaces according to any one of <1A> to <14A>, wherein the pH at 25°C is 4 or higher and 5.6 or lower.

[0102]

<17A> The sterilizing detergent composition for hard surfaces according to any one of <1A> to <14A>, wherein the pH at 25°C is 4.5 or higher and 5.6 or lower.

[0103]

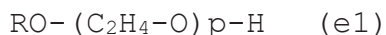
<18A> The sterilizing detergent composition for hard surfaces according to any one of <1A> to <14A>, wherein the pH at 25°C is 5 or higher and 5.6 or lower.

[0104]

<19A> The sterilizing detergent composition for hard surfaces according to any one of <1A> to <18A>, further containing a component (e) described below in an amount of 0.01% by mass or more and 10% by mass or less:

component (e): a compound represented by the general

formula (e1):



wherein, R is an aliphatic hydrocarbon group having 3 or more and 8 or less carbon atoms or a cyclic hydrocarbon group having 3 or more and 8 or less carbon atoms; and p is an integer of 1 or more and 8 or less.

[0105]

<20A> The sterilizing detergent composition for hard surfaces according to <19A>, wherein the component (e) is one or more kinds selected from ethyleneglycol monobutyl ether, diethyleneglycol monobutyl ether, triethyleneglycol monobutyl ether, ethyleneglycol monoisobutyl ether, diethyleneglycol monoisobutyl ether, diethyleneglycol monophenyl ether, pentaethyleneglycol monophenyl ether, hexaethyleneglycol monophenyl ether, ethyleneglycol monobenzyl ether, and diethyleneglycol monobenzyl ether.

[0106]

<21A> The sterilizing detergent composition for hard surfaces according to <19A> or <20A>, wherein the total content of the component (b) and the component (e) is 2.5% by mass or more, and the mass ratio (b)/(e) of the component (b) to the component (e) is 25/500 or more and 500/1 or less.

[0107]

<22A> The sterilizing detergent composition for hard surfaces according to any one of <19A> to <21A>, wherein the total

content of the component (b) and the component (e) is 4% by mass or more.

[0108]

<23A> The sterilizing detergent composition for hard surfaces according to any one of <19A> to <21A>, wherein the total content of the component (b) and the component (e) is 5% by mass or more.

[0109]

<24A> The sterilizing detergent composition for hard surfaces according to any one of <19A> to <23A>, wherein the mass ratio (b)/(e) of the component (b) to the component (e) is 50/500 or more and 500/500 or less.

[0110]

<25A> The sterilizing detergent composition for hard surfaces according to any one of <19A> to <23A>, wherein the mass ratio (b)/(e) of the component (b) to the component (e) is 100/500 or more and 300/500 or less.

[0111]

<26A> The sterilizing detergent composition for hard surfaces according to any one of <19A> to <23A>, wherein the mass ratio (b)/(e) of the component (b) to the component (e) is 100/500 or more and 200/500 or less.

[0112]

<27A> Use of the sterilizing detergent composition for hard surfaces according to any one of <1A> to <26A> for bathrooms.

[0113]

<28A>

A method of sterilizing and washing a hard surface, including washing the hard surface with the sterilizing detergent composition for hard surfaces according to any one of <1A> to <26A>, and rinsing the washed hard surface with water.

[0114]

<29A>

The method of sterilizing and washing a hard surface according to <28A>, wherein after the sterilizing detergent composition for hard surfaces according to any one of <1A> to <26A> is sprayed on the hard surface, the hard surface is washed.

[0115]

<30A>

The method of sterilizing and washing a hard surface according to <28A>, wherein the hard surface is washed with a cleaning article having the sterilizing detergent composition for hard surfaces according to any one of <1A> to <26A> carried on a base material.

Examples

[0116]

In the following examples, an implementation of the

present invention is described. The examples are intended to describe exemplification of the invention, and are not intended to limit the invention.

[0117]

The sterilizing detergent compositions for hard surfaces shown in Tables 1 to 3 were prepared. The compositions were evaluated for the detergency and the sterilizing property. The evaluation methods are shown below. The results were shown in Tables 1 to 3. Incidentally, the pH of the compositions was adjusted with hydrochloric acid or sodium hydroxide. In addition, in the tables, (a)/[total surfactants] represents the ratio of the component (a) in the total surfactants.

[0118]

<Evaluation method of detergency>

The detergency against a simulated bathroom stain in which soap scum and sebum are combined was evaluated. The method for preparing the simulated stain is shown below. A bar soap (KAO White) (90% by mass) and the simulated sebum stain (10% by mass) were mixed at 50 to 60°C while keeping the temperature, to give a solution A. Here, the composition of the simulated sebum stain was 40% by mass of linoleic acid, 20% by mass of oleic acid, 20% by mass of palmitic acid, 10% by mass of cholesterol and 10% by mass of liquid paraffin. The temperature of a calcium chloride solution having a German

hardness of 10° dH was kept at 20 to 30°C to give a solution B. The solution A was applied on a polypropylene plate (50 mm × 100 mm × 2 mm) as thinly and uniformly as possible, and naturally dried at 20 to 30°C for 5 minutes. The solution B was then applied therein as thinly and uniformly as possible, and naturally dried at 20 to 30°C for 5 minutes. This procedure of the application of the solution A, the natural dry, the application of the solution B, and the natural dry was repeated 30 to 50 times, whereby the simulated bathroom stain was produced.

[0119]

A paper disc of 8 mm ϕ was placed on the simulated bathroom stain, 40 μ l of a composition was added dropwise, and allowed to stand for 5 minutes, and then the plate was thoroughly rinsed with ion-exchange water. The detergency was determined according to the following criteria. As the specific method, pictures of a plate with no stain applied, a plate after stain application and before washing, and a plate after washing were taken under the same conditions such as the brightness, and from the obtained images, the gray scale of each plate was measured. The gray scale of the plate before stain washing was taken as 0%, and the gray scale of the plate with no stain applied was taken as 100%, and the washing rate of the plate after washing was calculated. For measuring the gray scale, an image processing software, Image J 1.47v was used.

- 1: Washing rate of less than 20%
- 2: Washing rate of 20% or more and less than 40%
- 3: Washing rate of 40% or more and less than 60%
- 4: Washing rate of 60% or more and less than 80%
- 5: Washing rate of 80% or more

[0120]

<Evaluation method of sterilizing property>

Escherichia coli (NBRC3972 strain) and *Staphylococcus aureus* (NBRC12732 strain) were each cultured on a nutrient agar medium (prepared from a nutrient agar reagent manufactured by Difco according to the instruction) at 37°C for 24 hours, this culture process was repeated twice. The resultant was scraped and then suspended and dispersed in a 1/2 nutrient liquid medium (prepared from a nutrient broth reagent manufactured by Difco in a 1/2 concentration of the instruction), and the bacterial concentration was adjusted to 2.5 to 13×10^8 cfu/mL using the 1/2 nutrient liquid medium, thereby producing a test bacterial suspension.

[0121]

In addition, on a potato dextrose plate agar medium (prepared from a potato dextrose agar reagent manufactured by Becton Dickinson according to the instruction) on which *Cladosporium sp. PA-4* was grown, 2 mL of a spore collecting liquid (a 0.05% solution of TWEEN 80 manufactured by Wako Pure Chemical Industries adjusted with a physiological saline

solution manufactured by Otsuka Pharmaceutical Factories, Inc.) was added dropwise, the medium was rubbed very gently with a bacteria spreader (manufactured by Nissui Pharmaceuticals, Co., Ltd.) and the collected liquid was filtered using Miracloth (manufactured by CALBIOCHEM) to remove the hyphae. The obtained liquid was centrifuged at 10000 rpm for 5 minutes and the supernatant was removed. These operations were repeated five times, and the resultant after the last centrifugation was adjusted with 1 mL of a spore collecting liquid (10-fold concentration), thereby producing a test spore fluid.

[0122]

The bacterial suspension adjusted to 10^8 cfu/mL or the spore fluid (10 μ L) was mixed with 1 mL of the test solution and brought into contact at 25°C for 5 minutes, and then a 100 μ L aliquot thereof was taken and suspended in 900 μ L of a LP diluted solution (prepared from a product manufactured by Nissui Pharmaceuticals, Co., Ltd. according to the instruction) to inactivate the test solution. This solution was further diluted with a LP diluting liquid, and then, for the *E. Coli* and *Staphylococcus aureus*, applied on a lecithin polysorbate-80-added soybean casein digest (prepared from the Soybean-Casein Digest Agar with Lecithin & Polysorbate 80 "DAIGO" reagent manufactured by Wako Pure Chemical Industries according to the instruction) agar medium and cultured at 37°C

overnight. For *Cladosporium*, the solution was applied on a potato dextrose plate agar medium (prepared from a potato dextrose agar reagent manufactured by Becton Dickinson according to the instruction) and cultured at 30°C for 4 days. Each bacterial number of survivals was calculated from the obtained colony count.

[0123]

In addition, the same operation (10 μ L of the bacterial suspension was mixed with 1 mL of the test solution and brought into contact for 5 minutes, and the mixture was mixed with a LP diluting liquid) except for using a physiological saline solution in place of the test solution was designated as a control operation, and the difference in logarithm between the bacterial number of survivals after the control operation and the bacterial number of survivals after the contact with the test solution was calculated and taken as an index of the bacteria elimination performance. In the tables, the "-" in the cell of the sterilizing property means that the evaluation of the sterilizing property was not performed.

[0124]

[Table 1]

				Example				Comparative Example				
				1-1	1-2	1-3	1-4	1-1	1-2	1-3	1-4	1-5
Bactericidal detergent composition for hard surfaces	Composition (% by mass)	(a)	Lauric acid amido propyl betaine	1.5	1.5	1.5	1.3	1.5	1.5	1.5	1.5	-
		(b)	Benzyl alcohol	4.5	4	1.5	1	-	2	3	4	4
		(c)	Citric acid	5	5	5	4	-	-	-	-	5
		(d)	Ion-exchange water	balance	balance	balance	balance	balance	balance	balance	balance	balance
		(e)	Diethyleneglycol monobutyl ether	-	-	4.5	4.5	-	-	-	-	-
			Sodium linear-alkylbenzenesulfonate	-	-	-	-	-	-	-	-	1.5
			Total	100	100	100	100	100	100	100	100	100
	pH (25°C)			2.0	3.0	5.2	5.2	5.2	5.2	5.2	5.2	3.0
	(a)/[Total surfactants] (% by mass)			100	100	100	100	100	100	100	100	0
Detergency				4	4	5	5	1	1	1	1	1
Bactericidal property		E. Coli		>6.0	>6.0	>6.0	>6.0	<1	>6.0	>6.0	>6.0	>6.0
		Staphylococcus aureus		>6.0	>6.0	>6.0	>6.0	<1	<1	2.8	>6.0	>6.0
		Cladosporium		5.5	4.2	2.1	-	-	-	-	-	-

[0125]

[Table 2]

				Example					Comparative Example					
				2-1	2-2	2-3	2-4	2-5	2-1	2-2	2-3	2-4	2-5	2-6
Bactericidal detergent composition for hard surfaces	Composition (% by mass)	(a)	Lauric acid amido propyl betaine	0.5	1	1.5	2	3	-	5	1.5	3	5	-
		(b)	Benzyl alcohol	1.5	1.5	1.5	1.5	1.5	1.5	1.5	1.5	1.5	1.5	1.5
		(c)	Citric acid	5	5	5	5	5	5	5	-	-	-	5
		(d)	Ion-exchange water	balance	balance	balance	balance	balance	balance	balance	balance	balance	balance	balance
		(e)	Diethyleneglycol monobutyl ether	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5
			Sodium linear-alkylbenzenesulfonate	-	-	-	-	-	-	-	-	-	-	1.5
			Total	100	100	100	100	100	100	100	100	100	100	100
	pH (25°C)			5.2	5.2	5.2	5.2	5.2	5.2	5.2	5.2	5.2	5.2	5.2
	(a)/[Total surfactants] (% by mass)			100	100	100	100	100	0	100	100	100	100	0
	Detergency			5	5	5	5	5	1	2	1	1	1	2
Bactericidal property	E. Coli			>6.0	>6.0	>6.0	>6.0	>6.0	>6.0	>6.0	>6.0	>6.0	>6.0	>6.0
	Staphylococcus aureus			>6.0	>6.0	>6.0	5.3	3.6	>6.0	1.4	<1	<1	<1	>6.0
	Cladosporium			2.4	2.3	2.1	-	-	-	<1	-	-	-	-

[0126] [Table 3]

				Example					Comparative Example	
				3-1	3-2	3-3	3-4	3-5	3-1	3-2
Bactericidal detergent composition for hard surfaces	Composition (% by mass)	(a)	Lauric acid amido propyl betaine	1.5	1.5	1.35	1.2	1.05	0.9	1.5
		(b)	Benzyl alcohol	1.5	1.5	1.5	1.5	1.5	1.5	1.5
		(c)	Citric acid	5	5	5	5	5	5	5
		(d)	Ion-exchange water	balance	balance	balance	balance	balance	balance	balance
		(e)	Diethyleneglycol monobutyl ether	4.5	4.5	4.5	4.5	4.5	4.5	4.5
			Sodium linear-alkylbenzenesulfonate	-	-	0.15	0.3	0.45	0.6	-
			Total	100	100	100	100	100	100	100
	pH (25°C)			5.2	6.0	5.2	5.2	5.2	5.2	7.5
	(a)/[Total surfactants] (% by mass)			100	100	90	80	70	60	100
	Detergency			5	4	5	5	4	2	1
Bactericidal property	E. Coli			>6.0	>6.0	>6.0	>6.0	>6.0	>6.0	>6.0
	Staphylococcus aureus			>6.0	4.0	>6.0	5.1	>6.0	4.8	>6.0
	Cladosporium			2.1	2.8	2.8	2.3	2.6	2.9	3.0

[0127]

The components in the tables represent the followings.

· Lauric acid amide propyl betaine: a compound represented by the general formula (a1), wherein R¹ is a linear alkyl group having 11 carbon atoms, R² and R³ each are a methyl group, X is an alkylene group having 1 carbon atom, q is 1, and r is 3.

· Sodium linear-alkylbenzenesulfonate: a sodium linear-alkylbenzenesulfonate in which the alkyl group is a mixed alkyl group of linear alkyl groups having 10 to 14 carbon atoms.

[0128]

Table 4 shows other examples of formulation of the composition of the present invention.

[0129][Table 4]

			Formulation Example							
			4-1	4-2	4-3	4-4	4-5	4-6	4-7	4-8
Bactericidal detergent composition for hard surfaces	Composition (% by mass)	(a)	Lauryl hydroxysulfobetaine	1.5	1.5	1.5	1.5	1.5	1.5	1.5
		(b)	Phenethyl alcohol	1.5	1.5	1.5	1.5	1.5	1.5	1.5
		(c-1)	Ethylenediaminetetraacetic acid	5	7	-	-	-	-	-
		(c-2)	L-Gultamic acid diacetic acid tetrasodium salt	-	-	5	7	-	-	-
		(c-3)	Methylglycine diacetic acid trisodium salt	-	-	-	-	5	7	-
		(c-4)	Malic acid	-	-	-	-	-	5	7
		(d)	Ion-exchange water	balance	balance	balance	balance	balance	balance	balance
		(e)	Diethyleneglycol monobutyl ether	4.5	4.5	4.5	4.5	4.5	4.5	4.5
	Total			100	100	100	100	100	100	100
	pH (25°C)			5.2	5.2	5.2	5.2	5.2	5.2	5.2
	(a)/[Total surfactants] (% by mass)			100	100	100	100	100	100	100

[0130]

The components of the table are the followings.

· Lauryl hydroxysulfobetaine: a compound represented by the general formula (a2), wherein R^1 is a linear alkyl group having 12 carbon atoms, R^2 and R^3 each are a methyl group, X is a hydroxypropylene group, q is 0, and r is 0.

Claims

1. A sterilizing detergent composition for hard surfaces, comprising:

0.5% by mass or more and 3% by mass or less of the following component (a);

0.5% by mass or more and 10% by mass or less of the following component (b);

1% by mass or more and 8% by mass or less of the following component (c); and

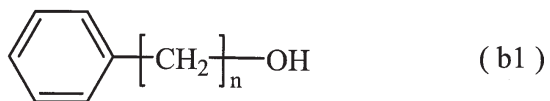
the following component (d),

wherein the ratio of the component (a) in the total of surfactants is 65% by mass or more, and

the pH at 25°C is 2 or higher and 6 or lower:

component (a): a betaine amphoteric surfactant;

component (b): a compound represented by the general formula (b1):



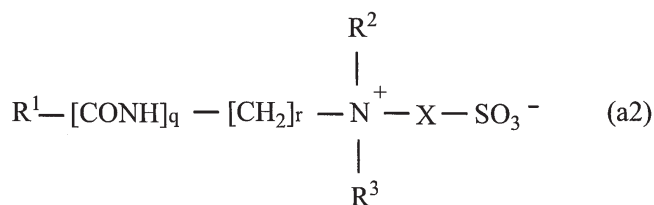
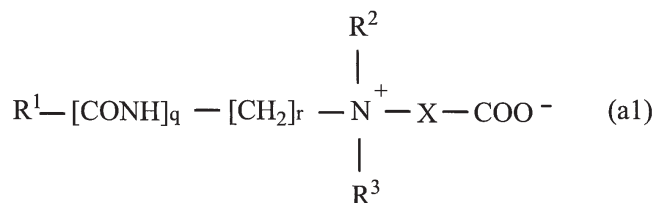
wherein, n represents an integer of 1 or more and 8 or less;

component (c): a chelating agent; and

component (d): water.

2. The sterilizing detergent composition for hard surfaces according to claim 1, wherein the component (a) is

one or more kinds selected form a betaine amphoteric surfactant represented by the following general formula (a1) and a betaine amphoteric surfactant represented by the following general formula (a2):



wherein, R¹ is a linear or branched alkyl group or alkenyl group having 5 or more and 18 or less carbon atoms; R² and R³ each represent an alkyl group having 1 or more and 5 or less carbon atoms, optionally substituted with a hydroxy group; X represents a linear or branched alkylene group having 1 or more and 3 or less carbon atoms, optionally substituted with a hydroxy group; q represents an integer of 0 or 1; and r represents an integer of 0 or more and 4 or less.

3. The sterilizing detergent composition for hard surfaces according to claim 1 or 2, wherein the ratio of the component (a) in the total of surfactants is 90% by mass or more.

4. The sterilizing detergent composition for hard

surfaces according to any one of claims 1 to 3, comprising, as a surfactant other than the component (a), one or more kinds selected from an anionic surfactant, a cationic surfactant, and a nonionic surfactant.

5. The sterilizing detergent composition for hard surfaces according to any one of claims 1 to 4, wherein the ratio of the surfactant other than the component (a) in the total of surfactants is 5% by mass or less.

6. The sterilizing detergent composition for hard surfaces according to any one of claims 1 to 5, wherein the component (b) is a compound selected from benzyl alcohol and phenethyl alcohol.

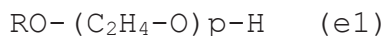
7. The sterilizing detergent composition for hard surfaces according to any one of claims 1 to 6, wherein the component (b) is contained in an amount of 0.5% by mass or more and 5% by mass or less.

8. The sterilizing detergent composition for hard surfaces according to any one of claims 1 to 7, wherein the chelating agent, the component (c), is a hydroxycarboxylic acid such as citric acid or malic acid, a condensed phosphoric acid such as pyrophosphoric acid, an aminocarboxylic acid such as ethylenediaminetetraacetic acid, or a salt thereof.

9. The sterilizing detergent composition for hard surfaces according to any one of claims 1 to 8, further comprising the following component (e) in an amount of 0.01%

by mass or more and 10% by mass or less:

component (e): a compound represented by the general formula (e1):



wherein, R is an aliphatic hydrocarbon group having 3 or more and 8 or less carbon atoms or a cyclic hydrocarbon group having 3 or more and 8 or less carbon atoms; and p is an integer of 1 or more and 8 or less.

10. The sterilizing detergent composition for hard surfaces according to claim 9, wherein the component (e) is one or more kinds selected from ethyleneglycol monobutyl ether, diethyleneglycol monobutyl ether, triethyleneglycol monobutyl ether, ethyleneglycol monoisobutyl ether, diethyleneglycol monoisobutyl ether, diethyleneglycol monophenyl ether, pentaethyleneglycol monophenyl ether, hexaethyleneglycol monophenyl ether, ethyleneglycol monobenzyl ether, and diethyleneglycol monobenzyl ether.

11. The sterilizing detergent composition for hard surfaces according to claim 9 or 10, wherein the total content of the component (b) and the component (e) is 2.5% by mass or more, and the mass ratio (b)/(e) of the component (b) to the component (e) is 25/500 or more and 500/1 or less.

12. Use of the sterilizing detergent composition for hard surfaces according to any one of claims 1 to 11 for bathrooms.

13. A method of sterilizing and washing a hard surface, comprising washing the hard surface with the sterilizing detergent composition for hard surfaces according to any one of claims 1 to 11, and rinsing the washed hard surface with water.

14. The method of sterilizing and washing a hard surface according to claim 13, wherein after the sterilizing detergent composition for hard surfaces is sprayed on the hard surface, the hard surface is washed.

15. The method of sterilizing and washing a hard surface according to claim 13, wherein the hard surface is washed with a cleaning article having the sterilizing detergent composition for hard surfaces carried on a base material.