

DESCRIPTION

Title of Invention

LIQUID CLEANING AGENT PRODUCT FOR TEXTILE PRODUCTS

5

TECHNICAL FIELD

[0001]

The present invention relates to a liquid cleaning agent product for textile
10 products.

Priority is claimed on Japanese Patent Application No. 2017-232019, filed on
December 1, 2017, the content of which is incorporated herein by reference.

15

BACKGROUND ART

[0002]

In homes and nursing facilities where an elderly person or a care receiver is
present, urine odor attached to clothing has become a problem. Furthermore, there is a
problem that the urine odor is hard to be removed by a normal laundry. In view of such
20 a situation, a detergent capable of reducing the urine odor attached to clothing (having a
high urine odor removal effect) is required in the market.

[0003]

PTL 1 proposes a liquid cleaning agent composition for textile products
containing an anionic surfactant, a nonionic surfactant, hydrogen peroxide, a sequestering
25 agent, a radical trapping agent, and water.

Citation List

Patent Literature

[0004]

- 5 [PTL 1] Japanese Unexamined Patent Application, First Publication No. 2014-214171

DISCLOSURE OF INVENTION

Technical Problem

10 [0005]

The composition of PTL 1 does not have a sufficient urine odor removal effect.

As a result of intensive studies, the present inventors have found that an acidic liquid cleaning agent containing a nonionic surfactant is effective for the urine odor removal.

- 15 However, the acidic liquid cleaning agent containing a nonionic surfactant easily absorbs oxygen gas contained in the air in a head-space (region occupied by the air in a container) in the container. There is a problem that the container is dented by the absorption of oxygen gas.

- 20 The present invention has been made in view of the above-mentioned circumstances, and an object of the present invention is to provide a liquid cleaning agent product for textile products, which has an excellent urine odor removal effect and oxygen gas absorption suppressing effect.

Solution to Problem

25 [0006]

The present inventors have found that the following liquid cleaning agent product for textile products can solve the problems.

That is, the present invention has the following aspects.

[1] A liquid cleaning agent product for textile products, including:

5 a liquid cleaning agent composition for textile products which contains a component (A), a component (B), and a component (C) and is stored in a flexible container,

 in which the component (A) is a nonionic surfactant,

 the component (B) is an organic carboxylic acid (other than a component

10 corresponding to the component (C)),

 the component (C) is an antioxidant,

 a content of the component (A) is 8% by mass or more with respect to a total mass of the liquid cleaning agent composition for textile products,

 a content of the component (B) is 5% by mass or more with respect to the total
15 mass of the liquid cleaning agent composition for textile products,

 a content of the component (C) is 0.0001% to 0.2% by mass with respect to the total mass of the liquid cleaning agent composition for textile products, and

 a pH at 25°C is less than 7.

[2] The liquid cleaning agent product for textile products according to [1],

20 in which the liquid cleaning agent composition for textile products further contains a component (D), and

 the component (D) is an antibacterial agent.

[3] The liquid cleaning agent product for textile products according to [1] or [2],

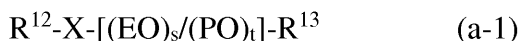
 in which the liquid cleaning agent composition for textile products further
25 contains a component (E), and

the component (E) is an anionic surfactant.

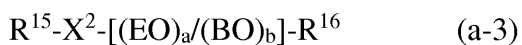
[4] The liquid cleaning agent product for textile products according to any one of [1] to [3],

in which the component (A) includes a compound represented by Formula (a-1)

5 and a compound represented by Formula (a-3),



in Formula (a-1), R^{12} represents a hydrocarbon group having 8 to 18 carbon atoms, X represents -O- or -C(O)O-, and R^{13} represents a hydrogen atom, an alkyl group having 1 to 6 carbon atoms, or an alkenyl group having 2 to 6 carbon atoms; s represents
 10 an average repeating number of EO, which is 3 to 20; t represents an average repeating number of PO, which is 0 to 6; and EO represents an oxyethylene group, PO represents an oxypropylene group, and EO and PO may be irregularly arranged,



in Formula (a-3), R^{15} represents a monovalent hydrocarbon group having 8 to 24
 15 carbon atoms, X^2 represents -O-, -C(O)O-, or -C(O)NH-, R^{16} represents a hydrogen atom, an alkyl group having 1 to 6 carbon atoms, or an alkenyl group having 2 to 6 carbon atoms, a represents an average repeating number of EO, which is 1 to 30, b represents an average repeating number of BO, which is 1 to 20, EO represents an oxyethylene group, BO represents an oxybutylene group, and EO and BO may be irregularly arranged.

20 [5] The liquid cleaning agent product for textile products according to any one of [1] to [4],

in which the component (B) is at least one kind selected from the group consisting of citric acid, tartaric acid, malic acid, lactic acid, hydroxybutyric acid, and glycolic acid.

25 [6] The liquid cleaning agent product for textile products according to any one

of [1] to [5],

in which the component (C) is at least one kind selected from the group consisting of dibutylhydroxytoluene (BHT), butylhydroxyanisole (BHA), vitamin E (tocopherol), sodium erythorbate, methoxyphenol, sulfur dioxide, an extract (chlorogenic acid) of a coffee bean, an extract (catechin) of a green tea, and an extract of rosemary.

[7] The liquid cleaning agent product for textile products according to any one of [1] to [6],

in which a mass ratio represented by the component (A) / the component (B) is 1.6 or more.

[8] The liquid cleaning agent product for textile products according to any one of [1] to [7],

in which a mass ratio represented by the component (B) / the component (C) is 25 or more.

[9] The liquid cleaning agent product for textile products according to any one of [1] to [8],

in which the liquid cleaning agent composition for textile products further contains a component (D),

the component (D) is at least one antibacterial agent selected from the group consisting of a component (d-1), a component (d-2), and a component (d-3),

the component (d-1) is a quaternary ammonium salt having, as a substituent of quaternary nitrogen atom, a linear or branched alkyl group having 1 to 16 carbon atoms, a linear or branched alkenyl group having 1 to 16 carbon atoms, a hydroxyalkyl group having 1 to 16 carbon atoms, or a phenylalkyl group having 1 to 16 carbon atoms,

the component (d-2) is a phenolic antibacterial agent, and

the component (d-3) is a biguanide compound.

[10] The liquid cleaning agent product for textile products according to any one of [1] to [8],

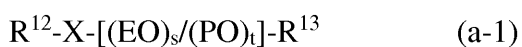
in which the liquid cleaning agent composition for textile products further contains a component (E), and

5 the component (E) is a linear alkylbenzene sulfonic acid or a salt thereof.

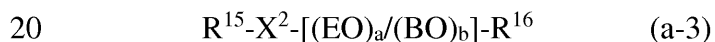
[11] The liquid cleaning agent product for textile products according to any one of [1] to [10],

in which the component (A) includes a compound represented by Formula (a-1) and a compound represented by Formula (a-3), and

10 a mass ratio represented by (the compound represented by Formula (a-1)) / (the compound represented by Formula (a-3)) is preferably 3 to 55, more preferably 4 to 20, and still more preferably 5 to 10,



in Formula (a-1), R^{12} represents a hydrocarbon group having 8 to 18 carbon atoms, X represents -O- or -C(O)O-, and R^{13} represents a hydrogen atom, an alkyl group having 1 to 6 carbon atoms, or an alkenyl group having 2 to 6 carbon atoms; s represents an average repeating number of EO, which is 3 to 20; t represents an average repeating number of PO, which is 0 to 6; and EO represents an oxyethylene group, PO represents an oxypropylene group, and EO and PO may be irregularly arranged,



in Formula (a-3), R^{15} represents a monovalent hydrocarbon group having 8 to 24 carbon atoms, X^2 represents -O-, -C(O)O-, or -C(O)NH-, R^{16} represents a hydrogen atom, an alkyl group having 1 to 6 carbon atoms, or an alkenyl group having 2 to 6 carbon atoms, a represents an average repeating number of EO, which is 1 to 30, b represents an average repeating number of BO, which is 1 to 20, EO represents an oxyethylene group,

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BO represents an oxybutylene group, and EO and BO may be irregularly arranged.

[12] The liquid cleaning agent product for textile products according to any one of [1] to [11],

in which the content of the component (A) is preferably 8% to 50% by mass,
5 more preferably 15% to 40% by mass, and still more preferably 15% to 30% by mass with respect to the total mass of the liquid cleaning agent composition for textile products.

[13] The liquid cleaning agent product for textile products according to any one of [1] to [12],

10 in which the content of the component (B) is preferably 5% to 20% by mass and more preferably 7% to 12% by mass with respect to the total mass of the liquid cleaning agent composition for textile products.

[14] The liquid cleaning agent product for textile products according to any one of [1] to [13],

15 in which the content of the component (C) is 0.001% to 0.05% by mass with respect to the total mass of the liquid cleaning agent composition for textile products.

[15] The liquid cleaning agent product for textile products according to any one of [1] to [14],

in which the pH at 25°C is preferably 2 to 6 and more preferably 3 to 5.

20 [16] A cleaning method of textile products including:

a step of bringing a textile product to which p-cresol is attached into contact with a cleaning liquid obtained by diluting the liquid cleaning agent composition for textile products stored in the flexible container in the liquid cleaning agent product for textile products according to any one of [1] to [15].

25 [0007]

The present invention further has the following aspects.

[1] A liquid cleaning agent composition for textile products, including:

a component (A);

a component (B); and

5 a component (C),

in which the component (A) is a nonionic surfactant,

the component (B) is an organic carboxylic acid (other than a component
corresponding to the component (C)),

the component (C) is an antioxidant,

10 a content of the component (A) is 8% by mass or more with respect to a total
mass of the liquid cleaning agent composition for textile products,

a content of the component (B) is 5% by mass or more with respect to the total
mass of the liquid cleaning agent composition for textile products,

a content of the component (C) is 0.0001% to 0.2% by mass with respect to the
15 total mass of the liquid cleaning agent composition for textile products, and

a pH at 25°C is less than 7.

[2] The liquid cleaning agent composition for textile products according to [1]
further including:

a component (D),

20 in which the component (D) is an antibacterial agent.

[3] The liquid cleaning agent composition for textile products according to [1] or

[2] further including:

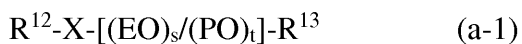
a component (E),

in which the component (E) is an anionic surfactant.

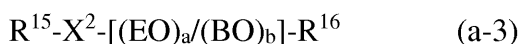
25 [4] The liquid cleaning agent composition for textile products according to any

one of [1] to [3],

in which the component (A) includes a compound represented by Formula (a-1) and a compound represented by Formula (a-3),



5 in Formula (a-1), R^{12} represents a hydrocarbon group having 8 to 18 carbon atoms, X represents -O- or -C(O)O-, and R^{13} represents a hydrogen atom, an alkyl group having 1 to 6 carbon atoms, or an alkenyl group having 2 to 6 carbon atoms; s represents an average repeating number of EO, which is 3 to 20; t represents an average repeating number of PO, which is 0 to 6; and EO represents an oxyethylene group, PO represents
10 an oxypropylene group, and EO and PO may be irregularly arranged,



in Formula (a-3), R^{15} represents a monovalent hydrocarbon group having 8 to 24 carbon atoms, X^2 represents -O-, -C(O)O-, or -C(O)NH-, R^{16} represents a hydrogen atom, an alkyl group having 1 to 6 carbon atoms, or an alkenyl group having 2 to 6 carbon
15 atoms, a represents an average repeating number of EO, which is 1 to 30, b represents an average repeating number of BO, which is 1 to 20, EO represents an oxyethylene group, BO represents an oxybutylene group, and EO and BO may be irregularly arranged.

[5] The liquid cleaning agent composition for textile products according to any one of [1] to [4],

20 in which the component (B) is at least one kind selected from the group consisting of citric acid, tartaric acid, malic acid, lactic acid, hydroxybutyric acid, and glycolic acid.

[6] The liquid cleaning agent composition for textile products according to any one of [1] to [5],

25 in which the component (C) is at least one kind selected from the group

consisting of dibutylhydroxytoluene (BHT), butylhydroxyanisole (BHA), vitamin E (tocopherol), sodium erythorbate, methoxyphenol, sulfur dioxide, an extract (chlorogenic acid) of a coffee bean, an extract (catechin) of a green tea, and an extract of rosemary.

[7] The liquid cleaning agent composition for textile products according to any
5 one of [1] to [6],

in which a mass ratio represented by the component (A) / the component (B) is 1.6 or more.

[8] The liquid cleaning agent composition for textile products according to any one of [1] to [7],

10 in which a mass ratio represented by the component (B) / the component (C) is 25 or more.

[9] The liquid cleaning agent composition for textile products according to any one of [1] to [8] further including:

a component (D),

15 in which the component (D) is at least one antibacterial agent selected from the group consisting of a component (d-1), a component (d-2), and a component (d-3),

the component (d-1) is a quaternary ammonium salt having, as a substituent of quaternary nitrogen atom, a linear or branched alkyl group having 1 to 16 carbon atoms, a linear or branched alkenyl group having 1 to 16 carbon atoms, a hydroxyalkyl group
20 having 1 to 16 carbon atoms, or a phenylalkyl group having 1 to 16 carbon atoms,

the component (d-2) is a phenolic antibacterial agent, and

the component (d-3) is a biguanide compound.

[10] The liquid cleaning agent composition for textile products according to any one of [1] to [8] further including:

25 a component (E),

in which the component (E) is a linear alkylbenzene sulfonic acid or a salt thereof.

[11] The liquid cleaning agent composition for textile products according to any one of [1] to [10],

5 in which the component (A) includes a compound represented by Formula (a-1) and a compound represented by Formula (a-3), and

a mass ratio represented by (the compound represented by Formula (a-1)) / (the compound represented by Formula (a-3)) is preferably 3 to 55, more preferably 4 to 20, and still more preferably 5 to 10,

10
$$R^{12}-X-[(EO)_s/(PO)_t]-R^{13} \quad (a-1)$$

in Formula (a-1), R^{12} represents a hydrocarbon group having 8 to 18 carbon atoms, X represents -O- or -C(O)O-, and R^{13} represents a hydrogen atom, an alkyl group having 1 to 6 carbon atoms, or an alkenyl group having 2 to 6 carbon atoms; s represents an average repeating number of EO, which is 3 to 20; t represents an average repeating
15 number of PO, which is 0 to 6; and EO represents an oxyethylene group, PO represents an oxypropylene group, and EO and PO may be irregularly arranged,

$$R^{15}-X^2-[(EO)_a/(BO)_b]-R^{16} \quad (a-3)$$

in Formula (a-3), R^{15} represents a monovalent hydrocarbon group having 8 to 24 carbon atoms, X^2 represents -O-, -C(O)O-, or -C(O)NH-, R^{16} represents a hydrogen atom,
20 an alkyl group having 1 to 6 carbon atoms, or an alkenyl group having 2 to 6 carbon atoms, a represents an average repeating number of EO, which is 1 to 30, b represents an average repeating number of BO, which is 1 to 20, EO represents an oxyethylene group, BO represents an oxybutylene group, and EO and BO may be irregularly arranged.

[12] The liquid cleaning agent composition for textile products according to any
25 one of [1] to [11],

in which the content of the component (A) is preferably 8% to 50% by mass, more preferably 15% to 40% by mass, and still more preferably 15% to 30% by mass with respect to the total mass of the liquid cleaning agent composition for textile products.

5 [13] The liquid cleaning agent composition for textile products according to any one of [1] to [12],

in which the content of the component (B) is preferably 5% to 20% by mass and more preferably 7% to 12% by mass with respect to the total mass of the liquid cleaning agent composition for textile products.

10 [14] The liquid cleaning agent composition for textile products according to any one of [1] to [13],

in which the content of the component (C) is 0.001% to 0.05% by mass with respect to the total mass of the liquid cleaning agent composition for textile products.

15 [15] The liquid cleaning agent composition for textile products according to any one of [1] to [14],

in which the pH at 25°C is preferably 2 to 6 and more preferably 3 to 5.

[16] A cleaning method of textile products including:

a step of bringing a textile product to which p-cresol is attached into contact with a cleaning liquid obtained by diluting the liquid cleaning agent composition for
20 textile products according to any one of [1] to [15].

Advantageous Effects of Invention

[0008]

According to the present invention, it is possible to provide a liquid cleaning
25 agent product for textile products, which has an excellent urine odor removal effect and

oxygen gas absorption suppressing effect.

BRIEF DESCRIPTION OF DRAWINGS

[0009]

5 FIG. 1 is a perspective view showing an example of a liquid cleaning agent product for textile products of the present invention.

BEST MODE FOR CARRYING OUT THE INVENTION

[0010]

10 A liquid cleaning agent product for textile products of the present invention includes a liquid cleaning agent composition for textile products of the present invention, which is stored in a flexible container.

 “Flexible” means that, when the pressure in a container changes, the container is flexibly deformed without being damaged.

15 For example, in a liquid cleaning agent product 1 for textile products in FIG. 1, a liquid cleaning agent composition 10 for textile products is stored in a container in which a bottle 100 and a bottle cap 110 are combined.

 An average thickness of the bottle 100 is preferably 0.1 to 5.0 mm.

 With the average thickness, flexibility can be imparted to the container.

20 The thickness of the container can be measured using a thickness gauge.

 Examples of the flexible container include a plastic container, a paper container, and a metal container.

 Examples of a constituent material of the plastic container include polyethylene (PE), polypropylene (PP), polyethylene terephthalate (PET), polybutylene terephthalate (PBT), polycyclohexylenedimethylene terephthalate (PCT), polyacetal (POM),

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polyethylene naphthalate (PEN), polystyrene (PS), acrylonitrile-butadiene-styrene resin (ABS), cellulose propionate (CP), polyarylate, polycarbonate, and acrylonitrile-styrene copolymer resin (AS).

Examples of a constituent material of the metal container include aluminum.

5 In addition, a laminate in which a metal foil adheres to a paper, a laminate in which a paper adheres to plastic, a laminate in which a metal foil adheres to plastic, and the like can also be used.

The volume of a head-space in the flexible container is preferably 25% by volume or less and more preferably 10% to 25% by volume.

10 In a case where the head-space is within the above-mentioned range, a dent of the container is easily suppressed.

[0011]

<<Liquid cleaning agent composition for textile products>>

The liquid cleaning agent composition for textile products of the present
15 invention contains the following components (A) to (C).

<Component (A)>

A component (A) is a nonionic surfactant. Specific examples thereof include a poly(oxyalkylene) alkyl ether (hereinafter, also referred to as a component (a-1)) represented by Formula (a-1).

20
$$R^{12}-X-[(EO)_s/(PO)_t]-R^{13} \quad (a-1)$$

In Formula (a-1), R^{12} represents a hydrocarbon group having 8 to 18 carbon atoms, X represents -O- or -C(O)O-, and R^{13} represents a hydrogen atom, an alkyl group having 1 to 6 carbon atoms, or an alkenyl group having 2 to 6 carbon atoms. s represents an average repeating number of EO, which is 3 to 20, and t represents an
25 average repeating number of PO, which is 0 to 6. EO represents an oxyethylene group,

PO represents an oxypropylene group, and EO and PO may be irregularly arranged.

[0012]

In Formula (a-1), the carbon number of the hydrocarbon group of R^{12} is 8 to 18, and preferably 10 to 18 from the viewpoint that particularly good cleaning ability can be easily obtained. R^{13} may be linear or branched. R^{12} is preferably an aliphatic hydrocarbon group and more preferably a linear or branched alkyl group or a linear or branched alkenyl group.

Examples of the hydrocarbon group as R^{12} include those derived from raw materials such as a primary or secondary higher alcohol, a higher fatty acid, a higher fatty acid amide. Specific examples thereof include a residue obtained by removing an OH group from the primary or secondary higher alcohol, a residue obtained by removing a C(O)OH group from the higher fatty acid, and a residue obtained by removing a C(O)NH group from the higher fatty acid amide.

The carbon number of the alkyl group as R^{13} is 1 to 6, and preferably 1 to 3. The carbon number of the alkenyl group as R^{13} is 2 to 6, and preferably 2 or 3.

X represents -O- or -C(O)O-. In a case where X represents -O-, the component (A) is an alcohol alkoxylate. In this case, since cleaning ability is good, the carbon number of R^{12} is preferably 10 to 18, and R^{12} may have an unsaturated bond. In addition, in this case, R^{13} is preferably a hydrogen atom.

In a case where X represents -C(O)O-, the component (A) is a fatty acid ester type nonionic surfactant. In this case, since cleaning ability is good, the carbon number of R^{12} is preferably 9 to 18 and more preferably 11 to 18. R^{12} may have an unsaturated bond. In addition, in this case, R^{13} is preferably an alkyl group having 1 to 3 carbon atoms.

[0013]

In the formula, s represents an average repeating number of an oxyethylene group (EO) and t represents an average repeating number of an oxypropylene group (PO). Each of the s and t indicates a weighted average value. s and t can be measured, for example, using a gas chromatograph-mass spectrometer.

5 s is 3 to 20, and preferably 5 to 18, more preferably 9 to 16, and still more preferably 14 to 16. In a case of being the above-mentioned lower limit value or more, a urine odor removal effect is easily improved. In a case of being the above-mentioned upper limit value or less, a urine odor removal effect is easily improved and an absorption of oxygen gas is easily prevented.

10 t is 0 to 6, and preferably 0 to 3. In a case where t exceeds 6, storage stability at high temperature tends to decrease.

EO and PO may be irregularly arranged, and EO and PO in $(EO)_s/(PO)_t$ may be added at random or in a block.

[0014]

15 In addition, as exemplified in Formula (a-2), the component (a-1) may be a compound in which EO and PO is added in an order of a block chain of EO, a block chain of PO, and a block chain of EO, or may be a compound in which EO and PO is added in an order of a random chain of EO and PO and a block chain of EO.



20 In Formula (a-2), R^{14} represents a hydrocarbon group having 8 to 18 carbon atoms. p represents an average repeating number of EO, q represents an average repeating number of PO, r represents an average repeating number of EO, and p, q, and r satisfy $p > 1$, $r > 1$, $0 < q \leq 3$, and $p + r = 10$ to 20. EO represents an oxyethylene group, PO represents an oxypropylene group, and EO and PO in $(EO)_p/(PO)_q$ may be
25 arranged at random or in a block.

R^{14} is the same as R^{12} of Formula (a-1), including the preferred aspect.

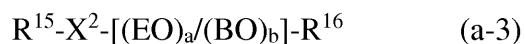
The component represented by Formula (a-2) can be produced by a known method. For example, the component represented by Formula (a-2) can be produced by
 5 subjecting an alcohol having a hydrocarbon group to an addition reaction of ethylene
 oxide and propylene oxide in this order or to a mix-addition (random addition) of
 ethylene oxide and propylene oxide, and then adding ethylene oxide thereto.

In a case of using the component (A) represented by Formula (a-2), an appropriate viscosity is easily obtained and gelation is suppressed. In addition, foaming properties are improved and biodegradability is further improved.

10 In particular, a ratio between EO and PO in Formula (a-2), as a ratio represented
 by $q / (p + r)$, is preferably 0.1 to 0.5 and more preferably 0.1 to 0.3. In a case where
 the ratio represented by $q / (p + r)$ is the lower limit value or more, bubbles are not
 excessively formed and an optimization of foaming is easily achieved. In a case of
 being the upper limit value or less, an appropriate viscosity is easily obtained and
 15 gelation is easily suppressed.

[0015]

The component (A) may be a nonionic surfactant (hereinafter, also referred to as
 a component (a-3)) represented by Formula (a-3). The component (a-3) may be
 produced by a conventional method, or a commercially available product may be used as
 20 the component (a-3).



[0016]

R^{15} represents a monovalent hydrocarbon group having 8 to 24 carbon atoms.
 The carbon number of R^{15} is preferably 10 to 18 from the viewpoint that particularly
 25 good cleaning ability can be easily obtained. R^{15} may be linear or branched, or may

include a cyclic structure. R^{15} may be a saturated hydrocarbon group, or may have an unsaturated bond.

R^{15} is preferably an aliphatic hydrocarbon group and more preferably a linear or branched alkyl group or a linear or branched alkenyl group.

5 [0017]

X^2 represents -O-, -C(O)O-, or -C(O)NH-. From the viewpoint of excellent defoaming property under an acidic condition, -O- is preferable.

R^{16} represents a hydrogen atom, an alkyl group having 1 to 6 carbon atoms, or an alkenyl group having 2 to 6 carbon atoms. The carbon number of the alkyl group is
10 preferably 1 to 3. The carbon number of the alkenyl group is preferably 2 or 3.

In a case where X^2 represents -O-, R^{16} is preferably a hydrogen atom.

[0018]

EO represents an oxyethylene group and BO represents an oxybutylene group.

In the formula, a represents an average repeating number of EO and b represents
15 an average repeating number of BO. Each of the a and b indicates a weighted average value. a and b can be measured, for example, using a gas chromatograph-mass spectrometer.

a is 1 to 30, and preferably 5 to 20 and more preferably 6 to 16. In a case where a is the above-mentioned upper limit value or less, it is possible to prevent a HLB
20 value from becoming too high and prevent cleaning ability from decreasing. On the other hand, in a case where a is the above-mentioned lower limit value or more, a deterioration of raw material odor of the component (A) can be prevented.

b is 1 to 20, and preferably 1 to 5 and more preferably 1 or 2. In a case where b is 1 or more, defoaming property under an acidic condition is excellent. In a case where
25 b is 20 or less, biodegradability is excellent.

The total of a and b is preferably 6 to 30, more preferably 7 to 20, and still more preferably 8 to 15.

EO and BO in $[(EO)_a/(BO)_b]$ may be arranged at random or in a block.

[0019]

5 As the component (a-3), the following compound is preferable.

a compound in Formula (a-3), in which R^{15} is an alkyl group having 9 to 11 carbon atoms, R^{16} is H, $-X^2-$ is $-O-$, a is 7 to 9, b is 1, and the total of s and t is 8 to 10.

[0020]

The content of the component (a-3) is preferably 0.1% to 15% by mass, more
10 preferably 0.5% to 6% by mass, and still more preferably 1% to 4.5% by mass with respect to the total mass of the liquid cleaning agent composition for textile products. In a case of being the lower limit value of the above-mentioned range or more, defoaming property is excellent, and in a case of being the upper limit value of the above-mentioned range or less, liquid stability is excellent.

15 A mass ratio (hereinafter, also referred to as a (a-1) / (a-3) ratio) represented by $[\text{the content of the component (a-1)}] / [\text{the content of the component (a-3)}]$ is preferably 3 to 55, more preferably 4 to 20, and still more preferably 5 to 10.

In a case of being the lower limit value of the above-mentioned range or more, defoaming property is excellent, and in a case of being the upper limit value of the
20 above-mentioned range or less, foaming property is excellent.

[0021]

The content of the component (a-3) is preferably 1% to 25% by mass, more preferably 5% to 20% by mass, and still more preferably 8% to 18% by mass with respect to the total mass of a surfactant in the liquid cleaning agent composition for
25 textile products. In a case of being the lower limit value of the above-mentioned range

or more, defoaming property is excellent, and in a case of being the upper limit value of the above-mentioned range or less, foaming property is excellent.

[0022]

In the component (A) represented by Formula (a-1), distribution of the average
5 repeating number of EO or PO easily varies depending on a reaction method at the time
of producing the component (A), and is not particularly limited. For example, in a case
where ethylene oxide or propylene oxide is added to a starting compound (such as a
primary or secondary higher alcohol, a higher fatty acid, and a higher fatty acid amide)
having a hydrocarbon group using a common alkali catalyst such as sodium hydroxide
10 and potassium hydroxide, the distribution tends to be relatively wide. On the other
hand, in a case where ethylene oxide or propylene oxide is added to the starting
compound having a hydrocarbon group using a specific alkoxylation catalyst, as
disclosed Japanese Examined Patent Application, Second Publication No. H06-15038,
such as magnesium oxide to which metal ions of Al^{3+} , Ga^{3+} , In^{3+} , Tl^{3+} , Co^{3+} , Sc^{3+} , La^{3+} ,
15 Mn^{2+} , and the like are added, the distribution tends to be relatively narrow.

[0023]

Specific examples of the component (A) include a compound in which 12 molar
equivalents or 15 molar equivalents of ethylene oxide is added to an alcohol such as trade
name Diadol (C13, C represents the carbon number, the same applies hereinafter)
20 manufactured by Mitsubishi Chemical Corporation., trade name Neodol (a mixture of
C12 and C13) manufactured by Shell Chemicals, and trade name Safol 23 (a mixture of
C12 and C13) manufactured by Sasol Limited;

a compound in which 12 molar equivalents or 15 molar equivalents of ethylene
oxide is added to a natural alcohol such as trade name CO-1214 or CO-1270
25 manufactured by P&G Chemicals;

a compound (trade name Lutensol TO7, manufactured by BASF) in which 7 molar equivalents of ethylene oxide is added to a C13 alcohol which is obtained by subjecting a C12 alkene obtained by trimerizing butene to an oxo method;

a compound (trade name Lutensol XP90, manufactured by BASF) in which 9 molar equivalents of ethylene oxide is added to a C10 alcohol which is obtained by subjecting pentanol to a Guerbet reaction;

a compound (trade name Lutensol XL70, manufactured by BASF) in which 7 molar equivalents of ethylene oxide is added to a C10 alcohol which is obtained by subjecting pentanol to a Guerbet reaction;

a compound (trade name Lutensol XA60, manufactured by BASF) in which 6 molar equivalents of ethylene oxide is added to a C10 alcohol which is obtained by subjecting pentanol to a Guerbet reaction; and

a compound (trade name SOFTANOL 90 and SOFTANOL 150, manufactured by NIPPON SHOKUBAI CO., LTD.) in which 9 molar equivalents or 15 molar equivalents of ethylene oxide is added to a secondary alcohol having 12 to 14 carbon atoms.

Furthermore, examples thereof include a compound (polyoxyethylene coconut fatty acid methyl ester (15 moles of EO) in which 15 molar equivalents of ethylene oxide is added to a methyl coconut fatty acid (lauric acid / myristic acid = 8 / 2) using an alkoxylation catalyst.

[0024]

As the component (A), particularly from the viewpoint of cleaning property, a polyoxyalkylene type nonionic surfactant such as polyoxyethylene alkyl ether (AE) and polyoxyethylene-polyoxypropylene alkyl ether (EPO type nonion), in which X represents -O- in Formula (a-1); or a fatty acid ester type nonionic surfactant in which X

represents -C(O)O- in Formula (a-1) is preferable. The fatty acid ester type nonionic surfactant is more preferable.

One kind of the component (A) may be used alone, or two or more kinds thereof may be used in combination.

5 [0025]

The content of the component (A) is 8% by mass or more, and preferably 15% by mass or more with respect to the total mass of the liquid cleaning agent composition for textile products.

The content of the component (A) is preferably 50% by mass or less, more
10 preferably 40% by mass or less, and still more preferably 30% by mass or less with respect to the total mass of the liquid cleaning agent composition for textile products.

Specifically, the content of the component (A) is preferably 8% to 50% by mass, more preferably 15% to 40% by mass, and still more preferably 15% to 30% by mass with respect to the total mass of the liquid cleaning agent composition for textile
15 products.

In a case of being the above-mentioned lower limit value or more, a sufficient urine odor removal effect is easily imparted.

In a case of being the above-mentioned upper limit value or less, stability is easily improved and an oxygen gas absorption suppressing effect is easily improved.

20 [0026]

<Component (B)>

A component (B) is an organic carboxylic acid (other than a component corresponding to a component (C)). Examples of the organic carboxylic acid include a hydroxycarboxylic acid (such as citric acid, tartaric acid, malic acid, and lactic acid)
25 having a carboxy group and a hydroxy group, oxalic acid, and malonic acid.

One kind of the component (B) may be used alone, or two or more kinds thereof may be used in combination.

It is preferable that the component (B) include a hydroxycarboxylic acid.

Among the hydroxycarboxylic acids, from the viewpoint of performance and supply
5 properties, citric acid, tartaric acid, malic acid, and lactic acid are preferable, citric acid
and tartaric acid are more preferable, and citric acid is particularly preferable.

[0027]

The content of the component (B) is 5% by mass or more, and preferably 5% to
20% by mass and more preferably 7% to 12% by mass with respect to the total mass of
10 the liquid cleaning agent composition for textile products.

In a case of being the above-mentioned lower limit value or more, a urine odor
removal effect is easily improved.

In a case of being the above-mentioned upper limit value or less, stability is
easily improved.

15 [0028]

A mass ratio (hereinafter, also referred to as an A / B ratio) represented by the
component (A) / the component (B) is preferably 1.6 or more, more preferably 1.8 to 8,
and still more preferably 2.0 to 4.

In a case of being the above-mentioned lower limit value or more, a urine odor
20 removal effect is easily improved.

In a case of being the above-mentioned upper limit value or less, a urine odor
removal effect is easily improved and stability of a composition is easily improved.

[0029]

<Component (C)>

25 A component (C) is an antioxidant. Examples of the component (C) include

dibutylhydroxytoluene (BHT), butylhydroxyanisole (BHA), vitamin E (tocopherol), sodium erythorbate, methoxyphenol, sulfur dioxide, an extract (chlorogenic acid) of a coffee bean, an extract (catechin) of a green tea, and an extract of rosemary.

One kind of the component (C) may be used alone, or two or more kinds thereof
5 may be used in combination.

[0030]

The content of the component (C) is 0.0001% to 0.2% by mass, and preferably 0.001% to 0.05% by mass with respect to the total mass of the liquid cleaning agent composition for textile products.

10 In a case of being the above-mentioned lower limit value or more, an oxygen gas absorption suppressing effect is easily improved.

In a case of being the above-mentioned upper limit value or less, appearance stability of a liquid composition is easily improved.

[0031]

15 A mass ratio (hereinafter, also referred to as a B / C ratio) represented by the component (B) / the component (C) is preferably 25 or more, more preferably 50 to 200000, and still more preferably 150 to 10000.

In a case of being the above-mentioned lower limit value or more, a urine odor removal effect is easily improved.

20 In a case of being the above-mentioned upper limit value or less, an oxygen gas absorption suppressing effect is easily improved.

[0032]

<Other optional components>

The liquid cleaning agent composition for textile products of the present
25 invention can appropriately contain a known component used in a liquid cleaning agent,

in addition to the above-mentioned components and water.

Examples thereof include optional components such as an antibacterial agent (hereinafter, also referred to as a component (D)), an anionic surfactant (hereinafter, also referred to as a component (E)), an amphoteric surfactant, an enzyme, a pH adjuster, a water-miscible organic solvent, a metal ion trapping agent, a preservative, a texture improver, a dye transfer inhibitor, a restaining inhibitor, a pearl agent, a soil release agent, a hydrotropic agent, a flavoring agent, a coloring agent, an emulsifier, a fluorescent agent, and an extract.

[0033]

The content of water is preferably 40% to 80% by mass and more preferably 50% to 70% by mass with respect to the total mass of the liquid cleaning agent composition for textile products.

The total content of each component does not exceed 100% by mass with respect to the total mass of the liquid cleaning agent composition for textile products.

[0034]

<Component (D)>

The component (D) is an antibacterial agent. As the component (D), at least one antibacterial agent selected from the group consisting of the following component (d-1), component (d-2), and component (d-3) is preferable.

Among the components (D), the component (d-2) and the component (d-3) are preferable, and the component (d-2) is more preferable. By using the component (d-2) or the component (d-3), antibacterial properties at low concentration can be exhibited, and the component (d-2) has good appearance stability.

Component (d-1): quaternary ammonium salt having, as a substituent of quaternary nitrogen atom, a linear or branched alkyl group having 1 to 16 carbon atoms,

a linear or branched alkenyl group having 1 to 16 carbon atoms, a hydroxyalkyl group having 1 to 16 carbon atoms, or a phenylalkyl group having 1 to 16 carbon atoms

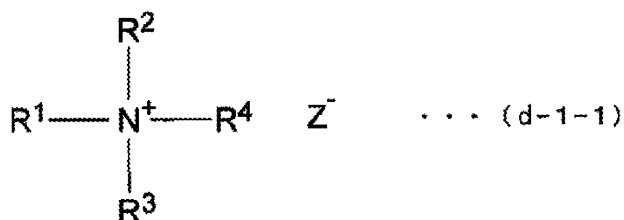
Component (d-2): phenolic antibacterial agent

Component (d-3): biguanide compound

5 [0035]

Examples of the component (d-1) include quaternary ammonium salts represented by Formulas (d-1-1), (d-1-2), and (d-1-3).

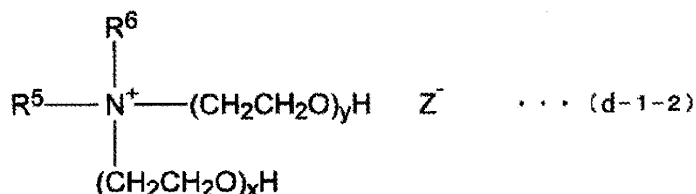
[0036]



10 [0037]

In Formula (d-1-1), two or more of R^1 to R^4 each independently represent an alkyl group having 1 to 3 carbon atoms or a hydroxyalkyl group having 1 to 3 carbon atoms, and the others are a linear or branched alkyl group having 8 to 16 carbon atoms or a linear or branched alkenyl group having 8 to 16 carbon atoms. Z^- represents a halogen ion or an alkyl sulfate ion.

[0038]

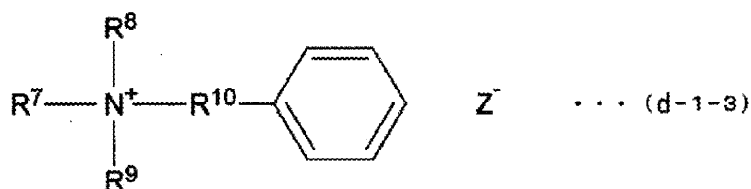


[0039]

In Formula (d-1-2), R^5 represents a linear or branched alkyl group having 8 to 16

carbon atoms or a linear or branched alkenyl group having 8 to 16 carbon atoms. R^6 represents an alkyl group having 1 to 3 carbon atoms, a hydroxyalkyl group having 1 to 3 carbon atoms, or an aromatic hydrocarbon group having 5 to 20 carbon atoms. x and y represent an average repeating number of an oxyethylene group, and are each independently an integer of 0 or more, and $x + y$ is 10 or more. Z^- represents a halogen ion or an alkyl sulfate ion.

[0040]



[0041]

In Formula (d-1-3), R^7 and R^8 each independently represent an alkyl group having 1 to 3 carbon atoms or a hydroxyalkyl group having 1 to 3 carbon atoms, R^9 represents a linear or branched alkyl group or alkenyl group having 8 to 16 carbon atoms, and R^{10} represents an alkylene group having 1 to 3 carbon atoms. Z^- represents a halogen ion or an alkyl sulfate ion.

The content of the component (d-1) is preferably 0.001% to 5% by mass, more preferably 0.01% to 3% by mass, and particularly preferably 0.2% to 2% by mass with respect to the total mass of the liquid cleaning agent composition for textile products.

[0042]

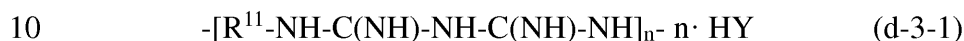
Examples of the component (d-2) include chlorophenolic antibacterial agents such as diclosan (4,4'-dichloro-2-hydroxydiphenyl ether), triclosan (2,4,4'-trichloro-2'-hydroxydiphenyl ether), chlorothymol, carvacrol, chlorophene, dichlorophen, hexachlorophen, chloroxilenol, and chlorocresol; o-phenylphenol, and

isopropylmethylphenol. Among these, diclosan is preferable.

The content of the component (d-2) is preferably 0.001% to 2% by mass, more preferably 0.01% to 0.5% by mass, and particularly preferably 0.02% to 0.1% by mass with respect to the total mass of the liquid cleaning agent composition for textile products.

[0043]

As the component (d-3), a biguanide compound having a structure represented by Formula (d-3-1), chlorhexidine hydrochloride (1,1'-Hexamethylene bis[5-(4-chlorophenyl) biguanide] dihydrochloride), or the like can be used.



In Formula (d-3-1), R^{11} represents an alkylene group having 2 to 8 carbon atoms, preferably an alkylene group having 4 to 8 carbon atoms and particularly a hexamethylene group, and n is 2 to 14, preferably 10 to 14, more preferably 11 to 13, and particularly preferably 12. HY represents an organic acid or an inorganic acid, preferably hydrochloric acid, gluconic acid, or acetic acid, and particularly, most preferably hydrochloric acid.

As the component (d-3), a compound in which R^{11} is a hexamethylene group and n is 10 to 14 in Formula (d-3-1) is suitable, furthermore, polyhexamethylene biguanide hydrochloride in which n is 11 to 13 is most suitable. As a preferred polyhexamethylene biguanide antibacterial agent, a commercially available product can be used, and poly(hexamethylene biguanide) hydrochloride (trade name Proxel IB (trademark)) in which R^{11} is a hexamethylene group, n is 12, and HY is hydrochloric acid in Formula (d-3-1) can be used.

The content of the component (d-3) is preferably 0.001% to 3% by mass, more preferably 0.005% to 0.5% by mass, and particularly preferably 0.01% to 0.1% by mass

with respect to the total mass of the liquid cleaning agent composition for textile products.

One kind of the component (D) may be used alone, or two or more kinds thereof may be used in combination.

5 [0044]

The content of the component (D) is preferably 0.001% by mass or more, more preferably 0.005% to 5% by mass, and still more preferably 0.01% to 3% by mass with respect to the total mass of the liquid cleaning agent composition for textile products.

In a case of being the above-mentioned lower limit value or more, a urine odor
10 removal effect and antibacterial properties are easily improved.

In a case of being the above-mentioned upper limit value or less, an anti-restaining effect (effect of preventing stain from being attached to an object to be cleaned again) is easily improved.

[0045]

15 <Component (E)>

The component (E) is an anionic surfactant (other than a component corresponding to the component (B)). In the present specification, the “higher” fatty acid refers to a fatty acid “having 8 to 22 carbon atoms”. The component (E) is not particularly limited, and examples thereof include an anionic surfactant commonly used
20 in a cleaning agent for textile products and the like.

Examples of the component (E) include a higher fatty acid salt; a linear alkylbenzene sulfonic acid or a salt thereof; an α -olefin sulfonate; a linear or branched alkyl sulfate ester salt; an alkyl ether sulfate ester salt or an alkenyl ether sulfate ester salt; an alkane sulfonate; an α -sulfo fatty acid ester salt; a carboxylic acid type anionic
25 surfactant such as a fatty acid or a salt thereof, an alkyl ether carboxylate, a

polyoxyalkylene ether carboxylate, an alkyl (or alkenyl) amide ether carboxylate, and an acylamino carboxylate; and a phosphate ester type anionic surfactant such as an alkyl phosphate ester salt, a polyoxyalkylene alkyl phosphate ester salt, a polyoxyalkylene alkyl phenyl phosphate ester salt, and a glycerin fatty acid ester monophosphate ester salt.

Examples of a salt thereof include alkali metal salts of sodium, potassium, and the like, alkaline earth metal salts of magnesium and the like, and alkanolamine salts such as a monoethanolamine salt or a diethanolamine salt.

[0046]

Among the above-mentioned compounds, in the linear alkylbenzene sulfonic acid and a salt thereof, the carbon number of a linear alkyl group is preferably 8 to 16 and particularly preferably 10 to 14.

The carbon number of the α -olefin sulfonate is preferably 10 to 20.

The carbon number of the alkyl sulfate ester salt is preferably 10 to 20.

As the alkyl ether sulfate ester salt or the alkenyl ether sulfate ester salt, a polyoxyethylene alkyl ether sulfate ester salt or a polyoxyethylene alkenyl ether sulfate ester salt which has a linear or branched alkyl group or alkenyl group having 10 to 20 carbon atoms and to which an average of 1 to 10 moles of ethylene oxide is added is preferable.

As the alkane sulfonate, a secondary alkane sulfonate which has an alkyl group having 10 to 20 carbon atoms, preferably 14 to 17 carbon atoms, is preferable.

As the α -sulfo fatty acid ester salt, an α -sulfo fatty acid ester salt which has 10 to 20 carbon atoms is preferable.

As the fatty acid or a salt thereof, a fatty acid or a salt thereof which has 10 to 20 carbon atoms is preferable.

Among these, from the viewpoint that a preventing effect of transferring urine odor or stability is easily enhanced, the linear alkylbenzene sulfonic acid or a salt thereof is preferably used as the component (E).

One kind of the component (E) may be used alone, or two or more kinds thereof
5 may be used in combination.

[0047]

The content of the component (E) is 2.5% by mass or more, and preferably 2.5% to 20% by mass, more preferably 3% to 15% by mass, and still more preferably 4% to 10% by mass with respect to the total mass of the liquid cleaning agent composition for
10 textile products.

In a case of being the above-mentioned lower limit value or more, a sufficient preventing effect of transferring urine odor is easily imparted.

In a case of being the above-mentioned upper limit value or less, stability is easily improved.

15 [0048]

The total mass of the surfactant is preferably 5% to 40% by mass, more preferably 10% to 35% by mass, and still more preferably 15% to 30% by mass with respect to the total mass of the liquid cleaning agent composition for textile products.

In a case of being the lower limit value of the above-mentioned range or more, cleaning
20 ability is excellent, and in a case of being the upper limit value of the above-mentioned range or less, stability of a liquid cleaning agent composition for textile products is excellent.

[0049]

The total content of other optional components other than the component (D)
25 and the component (E) is not particularly limited, but for example, is preferably 10% by

mass or less, more preferably 7% by mass or less, and still more preferably 5% by mass or less with respect to the total mass of the liquid cleaning agent composition for textile products.

As the flavoring agent, those which can be blended into a common detergent can be used, and a list of perfume raw materials used as a perfume of the detergent can be found in various documents, for example, "Perfume and Flavor Chemicals", Vol I and II, Steffen Arctander, Allured Pub. Co. (1994), "Gosei-Koryo Kagaku to Shouhin Chishiki (Synthetic Fragrances Chemicals and Product knowledge)" Genichi Indo, The Chemical Daily Co., Ltd. (1996), "Perfume and Flavor Materials of Natural Origin", Steffen Arctander, Allured Pub. Co. (1994), "Kaori no Hyakka (Encyclopedia of Perfumes)", edited by Nippon Koryo Kyokai, Asakura Publishing Co., Ltd. (1989), "Perfumery Material Performance V. 3. 3", Boelens Aroma Chemical Information Service (1996), "Flower oils and Floral Compounds In Perfumery", Danute Lajaujis Anonis, Allured Pub. Co. (1993), and the like, the content of which is incorporated herein by reference.

A perfume composition is preferably blended in the liquid cleaning agent composition for textile products of the present invention as a flavoring agent, and a blending amount thereof is 0.01% to 2% by mass, preferably 0.05% to 1% by mass, and more preferably 0.1% to 0.5% by mass with respect to the total mass of the liquid cleaning agent composition for textile products.

[0050]

Examples of the pH adjuster include an inorganic acid such as hydrochloric acid, sulfuric acid, and phosphoric acid, sodium hydroxide, potassium hydroxide, alkanolamine, and ammonia. Among these, from the viewpoint of stability of a liquid cleaning agent over time, sulfuric acid, sodium hydroxide, potassium hydroxide, and alkanolamine are preferable, and sulfuric acid and sodium hydroxide are preferable.

One kind of the pH adjuster may be used alone, or two or more kinds thereof may be used in combination.

[0051]

The “water-miscible organic solvent” is an organic solvent which is dissolved in 1L of ion exchanged water at 25°C for 50g or more, and a known organic solvent in the liquid cleaning agent can be used.

Examples thereof include monohydric alcohols having 2 to 4 carbon atoms such as ethanol, 1-propanol, 2-propanol, and 1-butanol; polyhydric alcohols having 2 to 4 carbon atoms such as ethylene glycol, propylene glycol, butylene glycol, triethylene glycol, tetraethylene glycol, polyethylene glycol having a mass-average molecular weight of approximately 200 to 5000, methoxy polyethylene glycol, and glycerin; glycol ether solvents such as ethylene glycol monobutyl ether, ethylene glycol monohexyl ether, ethylene glycol monophenyl ether, propylene glycol monophenyl ether, diethylene glycol monomethyl ether, diethylene glycol monobutyl ether, and CELTOL EDGAC (diethylene glycol monoethyl ether acetate) manufactured by DAICEL CORPORATION., 3-methoxybutanol, 3-methoxy-3-methylbutanol, 3-methoxy-2-methylbutanol, 3-methoxy-1-methylbutanol, 3-methoxy-3-methylbutyl acetate, 1,3-dioxolane, 2-methyl-1,3-dioxolane, 2,2-dimethyl-1,3-dioxolane, 2,2-dimethyl-1,3-dioxolane-4-methanol, 2-isobutyl-2-methyl-1,3-dioxolane-4-methanol, and 2,2-dimethyl-1,3-dioxolane-4-ethanol.

[0052]

In the liquid cleaning agent composition for textile products of the present invention, a pH at 25°C is less than 7, and preferably 2 to 6 and more preferably 3 to 5. In a case where the pH is within the range, a urine odor removal effect is easily improved.

The pH of the liquid cleaning agent composition for textile products can be

adjusted as necessary by adding the pH adjuster.

In the present specification, the pH refers to a value measured with a measuring object at 25°C using a pH meter (product name: HM-30G, manufactured by DKK-TOA CORPORATION).

5 The total content of each component of the liquid cleaning agent composition for textile products of the present invention does not exceed 100% by mass.

[0053]

<Production method>

10 The liquid cleaning agent composition for textile products of the present invention can be produced in accordance with a known production method of a liquid cleaning agent in the related art. For example, the liquid cleaning agent composition for textile products is produced by adding and mixing each component except for a pH adjuster to a part of water as a dispersion medium, adjusting to an arbitrary pH by adding the pH adjuster, and then adding the remaining amount of water to adjust total amount of
15 100% by mass.

A using method of the liquid cleaning agent composition product for textile products of the present invention includes filling the flexible container with the liquid cleaning agent composition for textile products obtained by the above-mentioned production method.

20 [0054]

<Using method>

The using method of the liquid cleaning agent composition product for textile products of the present invention includes a step of bringing a textile product to which p-cresol is attached into contact with a cleaning liquid obtained by diluting a liquid
25 cleaning agent composition for textile products stored in a flexible container in the liquid

cleaning agent product for textile products. p-cresol is included in odor which remains after urine has dried. In a case where p-cresol is mixed with odor of old age or odor of sebum, odor becomes more unpleasant.

5 Examples of the textile products include a textile material, an intermediate product, and a final product.

Examples of the textile material include cotton, hemp, silk, wool (such as sheep wool), and chemical fibers (such as polyester and polyamide).

Examples of the intermediate product include yarns, fabrics, knits, and felts.

10 Examples of the final product include clothing material, towels, bedding (such as sheet and pillowcase), floor coverings, and upholstery (such as curtain).

The using method of the liquid cleaning agent composition for textile products of the present invention includes a step of bringing a textile product to which p-cresol is attached into contact with a cleaning liquid obtained by diluting a liquid cleaning agent composition for textile products.

15 It is preferable that the cleaning liquid is prepared by diluting the liquid cleaning agent composition for textile products by 100 to 3000 times (based on mass). A solvent to be used for the dilution is preferably water.

20 Examples of a method of contacting the textile products to which p-cresol attached include applying the cleaning liquid to the textile products to which p-cresol attached, and immersing the textile products in the cleaning liquid.

The time for contacting the textile products to which p-cresol attached is preferably 5 to 30 minutes.

The temperature of contacting the textile products to which p-cresol attached is preferably 15°C to 45°C.

25 Examples of the using method of the liquid cleaning agent composition for

textile products of the present invention include a method of pouring the liquid cleaning agent composition for textile products into water alone or together with a known bleaching agent or softening agent to prepare a cleaning liquid, and then placing an object to be cleaned in the cleaning liquid and cleaning the object to be cleaned with a laundry machine, and a method of soaking an object to be cleaned in the cleaning liquid for a certain time, and then cleaning with a laundry machine.

The liquid cleaning agent composition for textile products of the present invention is preferably used for cleaning clothing material (hereinafter, also referred to as a care article) for elderly person or care receiver. In addition, the liquid cleaning agent composition for textile products of the invention is not limited to cleaning clothing material for elderly person or care receiver, and can be suitably used for clothing with urine stains, such as urine-stained clothing due to light incontinence, urine-stained clothing of infants, or urine-stained clothing or mats of pets.

EXAMPLES

[0055]

Hereinafter, the present invention will be described in more detail using the following examples, but the present invention is not limited to these examples.

Each component was mixed according to compositions shown in Tables 2 and 3, and a pH adjuster was added thereto so that a pH is adjusted to values shown in Tables 2 and 3, thereby obtaining each of the composition.

The unit of the blending amount in the tables is “% by mass”, and all the components are indicated by an amount in terms of pure content.

The blank in the tables indicates that the component is not blended.

“Balance” refers to that water is blended such that the total blending amount (% by mass) of all the blended components contained in the composition of each example is

100% by mass.

Hereinafter, the components shown in the tables will be described.

[0056]

<Component (A)>

- 5 · a-1: polyoxyethylene alkyl (carbon number: 12 to 14) ether (average number of moles of EO added: 15), trade name “LMAO-90”, manufactured by Lion Specialty Chemicals Co., Ltd. In Formula (a-1), R^{12} is an alkyl group having 12 to 14 carbon atoms, X is O, s is 15, t is 0, and R^{13} is H.

<Component (B)>

- 10 · b-1: citric acid, trade name “Citric acid”, manufactured by KANTO KAGAKU
- b-2: L(+)-tartaric acid, trade name “L(+)-Tartaric Acid”, manufactured by Wako Pure Chemical Corporation
- b-3: lactic acid, trade name “PURAC HS50”, manufactured by Corbion Japan K.K.

15 <Component (C)>

- c-1: BHT, trade name “SUMILZER BHT-R”, manufactured by Sumitomo Chemical Co., Ltd.
- c-2: p-methoxyphenol, trade name “MQ-F”, manufactured by Kawaguchi Chemical Industry Co., LTD.

20 <Optional component>

- PEG: polyethylene glycol (water-miscible organic solvent), manufactured by Lion, trade name “PEG1000”
- Sodium benzoate: sodium benzoate (preservative), manufactured by TOAGOSEI CO., LTD.

- 25 · Perfume: perfume composition in Table 1

- pH adjuster (NaOH): manufactured by Tsurumi Soda Co., Ltd., trade name:

Sodium hydroxide

- pH adjuster (sulfuric acid): manufactured by Wako Pure Chemical

Corporation, trade name: Sulfuric acid

- 5 · Water

[0057]

<Evaluation of urine odor removal effect>

(1) Preparation of clothing material with urine odor

200 μ L of a composition consisting of 0.1% by mass of p-cresol, 1% by mass of

10 tricalcium phosphate, 1% by mass of gelatin, and water were applied to one piece of
cotton underwear (Supima cotton, manufactured by Uniqlo) which was cut into a square
having a side of 5 cm, and left at 40°C for 30 minutes. The preparation was repeated
five times, and the produced five cloths were used as a test cloth.

(2) Cleaning with composition

15 The test cloths were subjected to a cleaning test as described below.

As a cleaning tester, Terg-O-tometer (manufactured by UNITED STATES
TESTING Company Inc.) was used. As a cleaning liquid, a solution prepared by
adding the liquid cleaning agents shown in Tables 2 and 3 to 900 mL of water so as to
have a concentration of 833 ppm and stirring for 30 seconds was used. 900 mL of the
20 cleaning liquid, the five test cloths, and a knitted cleaning cloth were put into the
cleaning tester, and cleaned at 120 rpm and 15°C for 20 minutes according to a bath ratio
of 20 times. Next, they were transferred to a twin-tub laundry machine (manufactured
by Mitsubishi Electric Corporation, product name: CW-C30A1-H1), dehydrated for 1
minute, rinsed in 30 L of tap water (15°C, 4 °DH) for 3 minutes, and dehydrated for 1
25 minute again.

(3) Sensory evaluation of urine odor

The sensory evaluation of urine odor was performed by a method in which each panelist smelled odor of the five test cloths and evaluated an odor intensity in six-level based on the following evaluation standard, and an average score of the odor intensity of the five cloths was calculated for each panelist. As the score of the odor intensity is high, odor is lower.

In addition, a deodorizing effect was evaluated based on the average score (average scores of six persons) of sensory evaluation, according to the following standard.

10 (Evaluation of odor intensity)

Score 5: no off-odor smelled

Score 4: very faint off-odor smelled in an extent that can be perceived in some way

Score 3: weak off-odor smelled

15 Score 2: somewhat strong off-odor smelled

Score 1: strong off-odor smelled

Score 0: intense off-odor smelled

(Evaluation standard)

A: average score of sensory evaluation was 3.0 or more

20 B: average score of sensory evaluation was 2.5 to 2.9

C: average score of sensory evaluation was 2.0 to 2.4

D: average score of sensory evaluation was 1.9 or less

[0058]

<Evaluation of oxygen gas absorption suppressing effect>

25 15.00 g of each of the composition was placed in a 20 mL crimp vial for head-

space, and the crimp vial was completely sealed.

After storage at 50°C for 1 month, an oxygen gas concentration of the head-space in the vial was measured using GC-MS.

From the obtained oxygen gas concentration, an oxygen gas absorption
5 suppressing effect was evaluated based on the following evaluation standard. As the
residual oxygen gas concentration is high, the oxygen gas absorption suppressing effect
is more excellent.

(Evaluation standard)

A: residual oxygen gas concentration in head-space was 18% or more

10 B: residual oxygen gas concentration in head-space was 10% or more and less
than 18%

D: residual oxygen gas concentration in head-space was less than 10%

[0059]

[Table 1]

Component name	
Aldehyde C-12 lauric	0.2
Anisaldehyde	0.5
Bacdanol	1.0
Citronellyl nitrile	1.0
Cyclacet	4.0
Cyclohexyl salicylate	1.0
Damascone alpha	1.0
Fruitate	4.0
Galaxolide 50%DPG	10.0
γ -Undecalactone	1.0
γ -Decalactone	1.0
Hedione	10.0
Hexyl salicylate	2.0
Iso-E-Super	15.0
Ligustral	0.5
Lilial	10.0
Linalool	4.0
Manzanate	0.5
Methyl Ionone Gamma	2.0
Yara	0.5
Orange oil	5.0
Phenylethyl alcohol	2.0
Raspberry ketone	2.0
Styralyl Acetate	0.5
Tetrahydrolinalool	3.0
Tesalon	1.0
Verdox	3.0
2-Methylundecanal	0.2
Bourgeonal	3.0
Peonile	1.0
Coumarin	2.0
Dipropylene glycol	8.1
Total	100.0

[0062]

From the results in Tables 2 and 3, Examples 1 to 16 to which the present invention was applied were excellent in the urine odor removal effect and the oxygen gas absorption suppressing effect.

5 Comparative Example 1 in which the content of the component (A) is less than 8% by mass was inferior in the urine odor removal effect.

Comparative Example 2 not containing the component (C) was inferior in the oxygen gas absorption suppressing effect.

10 Comparative Example 3 having a pH of 7.0 was inferior in the urine odor removal effect.

Comparative Example 4 not containing the component (B) was inferior in the urine odor removal effect.

Comparative Example 5 in which the content of the component (B) is less than 5% by mass was inferior in the urine odor removal effect.

15 [0063]

<Example 17>

A liquid cleaning agent composition for textile products was obtained in the same manner as in Example 1, except that the amount of a-1 was changed to 20% by mass, and 4% by mass of a nonionic surfactant (compound in which R¹⁵ is an alkyl group having 10 carbon atoms, R¹⁶ is H, -X²⁻ is -O-, a is 8, and b is 1 in Formula (a-3))
20 represented by Formula (a-3) was added. a / b was 2, b / c was 3333, a / c was 6667, and pH was 3.2.

In the same manner as in Example 1, the urine odor removal effect and the oxygen gas absorption suppressing effect were evaluated, and the results of both were A.

25 Further, as described below, foaming property and defoaming property were evaluated,

and the results of both were A.

[0064]

<Evaluating method of foaming property and defoaming property>

0.25 g of the liquid cleaning agent of each example was dissolved in 100 mL of
 5 tap water adjusted to 25°C to prepare a cleaning liquid. 20 mL of the cleaning liquid
 was taken into an Epton tube, and the Epton tube was shaken by hand 20 times at 1
 stroke/sec.

Immediately after and 5 minutes after the completion of shaking of the Epton
 tube, an amount (mL; volume from a boundary between bubbles and the cleaning liquid
 10 to an upper end face of bubbles) of each bubble was read on a scale of the Epton tube.

Using the amount of bubbles as an index, evaluation was performed based on
 the following evaluation standard. As the amount of bubbles immediately after is large,
 foaming property is more excellent, and as the amount of bubbles 5 minutes after is
 small, defoaming property is more excellent.

15 (Evaluation standard of foaming property)

A: amount of bubbles immediately after was 20 mL or more

B: amount of bubbles immediately after was 16 mL or more and less than 20 mL

C: amount of bubbles immediately after was 13 mL or more and less than 16 mL

D: amount of bubbles immediately after was less than 13 mL

20 (Evaluation standard of defoaming property)

A: amount of bubbles 5 minutes after was less than 10 mL

B: amount of bubbles 5 minutes after was 10 mL or more and less than 15 mL

C: amount of bubbles 5 minutes after was 15 mL or more and less than 20 mL

D: amount of bubbles 5 minutes after was 20 mL or more

25 [0065]

<Example 18>

A liquid cleaning agent composition for textile products was obtained in the same manner as in Example 1, except that the amount of a-1 was changed to 20% by mass, and 4% by mass of an anionic surfactant (LAS, linear or branched alkylbenzene sulfonic acid having an alkyl group having 10 to 14 carbon atoms, trade name “Lion (trademark) LH-200”, manufactured by Lion) was added. a / b was 2, b / c was 3333, a / c was 6667, and pH was 3.2.

In the same manner as in Example 1, the urine odor removal effect and the oxygen gas absorption suppressing effect were evaluated, and the results of both were A. Further, as described below, a preventing effect of transferring urine odor was evaluated, and the result was B.

[0066]

<Evaluation of preventing effect of transferring urine odor>

(1) Preparation of clothing material with urine odor

Underpants of cotton pajamas with a leakage of urine were collected from families with a care receiver. An object to be collected was clothing which had been used for 1 year or more, had a frequency of the leakage of urine of 3 times or more per week, and in which urine odor could not be removed even after regular laundry. After the collection, the panelist selected score 0 or score 1 in an odor intensity according to the sensory evaluation of (3) described below, and selected clothing of 4 families having a “very unique and very depressing odor”, which is a feature of clothing having a large amount of p-cresol. The clothing was cut into a square having a side of 4 cm to obtain a test cloth.

(2) Cleaning with composition

The test cloths were subjected to a cleaning test as described below. As a

cleaning tester, Terg-O-tometer (manufactured by UNITED STATES TESTING Company Inc.) was used. As a cleaning liquid, a cleaning liquid prepared by adding the liquid cleaning agent composition for textile products shown in Tables 2 and 3 to 900 mL of water so as to have a concentration of 833 ppm and stirring for 30 seconds was used.

5 900 mL of the cleaning liquid, the five test cloths, five wet-type artificially stained cloths (manufactured by Association of Laundry Science), five wet-type artificially stained cloths (trade name “EMPA116”, manufactured by EMPA), as an evaluation cloth of urine odor transfer, five sheets of cotton undershirts (LL size, manufactured by B.V.D.) which was cut into a square having a side of 4 cm, and a knitted cleaning cloth were put into the
10 cleaning tester, and cleaned at 120 rpm and 15°C for 20 minutes according to a bath ratio of 20 times. Next, they were transferred to a twin-tub laundry machine (manufactured by Mitsubishi Electric Corporation, product name: CW-C30A1-H1), dehydrated for 1 minute, rinsed in 30 L of tap water (15°C, 4 °DH) for 3 minutes, and dehydrated for 1 minute again.

15 (3) Sensory evaluation of urine odor transfer

The sensory evaluation of urine odor was performed by a method in which each panelist smelled odor of four sets, in which five evaluation cloths of urine odor transfer of one family was one set, and evaluated an odor intensity in six-level based on the following evaluation standard, and an average score of the odor intensity of the four sets
20 was calculated for each panelist. As the score of the odor intensity is high, odor is lower. In addition, a deodorizing effect was evaluated based on the average score (average scores of six persons) of sensory evaluation, according to the following standard.

(Evaluation of odor intensity)

25 Score 5: no off-odor smelled

Score 4: very faint off-odor smelled in an extent that can be perceived in some way

Score 3: weak off-odor smelled

Score 2: somewhat strong off-odor smelled

5 Score 1: strong off-odor smelled

Score 0: intense off-odor smelled

(Evaluation standard)

B: average score of sensory evaluation was 4.0 or more

C: average score of sensory evaluation was 3.0 to 3.9

10 D: average score of sensory evaluation was 2.9 or less

[0067]

<Example 19>

A liquid cleaning agent composition for textile products was obtained in the same manner as in Example 1, except that 1% by mass of an antibacterial agent (alkyl
15 chloride (carbon number: 12) trimethylammonium, manufactured by Lion Akzo Co., Ltd., trade name "Arquad 12-37W") was further added. a / b was 2.5, b / c was 3333, a / c was 8333, pH was 3.2.

In the same manner as in Example 1, the urine odor removal effect and the oxygen gas absorption suppressing effect were evaluated, and the results of both were A.
20 Further, as described below, antibacterial properties were evaluated, and the result was A.

[0068]

<Example 20>

A liquid cleaning agent composition for textile products was obtained in the same manner as in Example 1, except that 0.1% by mass of an antibacterial agent
25 (diclosan (4,4'-dichloro-2-hydroxydiphenyl ether), trade name "TINOSAN HP100",

manufactured by BASF) was further added. a / b was 2.5, b / c was 3333, a / c was 8333, pH was 3.2.

In the same manner as in Example 1, the urine odor removal effect and the oxygen gas absorption suppressing effect were evaluated, and the results of both were A.

5 Further, as described below, antibacterial properties were evaluated, and the result was A.

[0069]

<Evaluation of antibacterial properties>

(1) Sample to be used

The test cloths after the evaluation of the urine odor removal effect were used.

10 (2) Room drying conditions

The room drying conditions were set to such that the cleaned test cloths were lined up on a net for 8 hours in a room at 24°C and a relative humidity of 95% RH.

(3) Sensory evaluation of urine odor

The evaluation was performed in the same manner as the evaluation of the urine
15 odor removal performance. The sensory evaluation of urine odor was performed by a method in which each panelist smelled odor of four sets, in which four test cloths of one family was one set, and evaluated an odor intensity in six-level based on the following evaluation standard, and an average score of the odor intensity of the four sets was calculated for each panelist. As the score of the odor intensity is high, odor is lower.

20 In addition, the antibacterial properties were evaluated based on the average score (average scores of six persons) of sensory evaluation, according to the following standard.

(Evaluation of odor intensity)

Score 5: no off-odor smelled

25 Score 4: very faint off-odor smelled in an extent that can be perceived in some

way

Score 3: weak off-odor smelled

Score 2: somewhat strong off-odor smelled

Score 1: strong off-odor smelled

5 Score 0: intense off-odor smelled

(Evaluation standard)

A: average score of sensory evaluation was 3.0 or more

B: average score of sensory evaluation was 2.5 to 2.9

C: average score of sensory evaluation was 2.0 to 2.4

10 D: average score of sensory evaluation was 1.9 or less

Industrial Applicability

[0070]

According to the present invention, it is possible to provide a liquid cleaning
 15 agent product for textile products, which has an excellent urine odor removal effect and
 oxygen gas absorption suppressing effect.

Reference Signs List

[0071]

20 1: liquid cleaning agent product for textile products
 10: liquid cleaning agent composition for textile products
 100: bottle
 110: bottle cap

CLAIMS

1. A liquid cleaning agent product for textile products, comprising:

a liquid cleaning agent composition for textile products which contains a component (A), a component (B), and a component (C) and is stored in a flexible container,

wherein the component (A) is a nonionic surfactant,

the component (B) is at least one kind selected from the group consisting of citric acid, tartaric acid, malic acid, lactic acid, oxalic acid, and malonic acid (other than a component corresponding to the component (C)),

the component (C) is an antioxidant,

a content of the component (A) is 8% by mass or more with respect to a total mass of the liquid cleaning agent composition for textile products,

a content of the component (B) is 5% by mass or more with respect to the total mass of the liquid cleaning agent composition for textile products,

a content of the component (C) is 0.0001% to 0.2% by mass with respect to the total mass of the liquid cleaning agent composition for textile products, and

a pH at 25°C is less than 7.

2. The liquid cleaning agent product for textile products according to claim 1,

wherein the liquid cleaning agent composition for textile products further contains a component (D), and

the component (D) is an antibacterial agent.

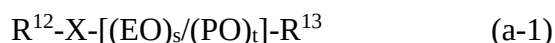
3. The liquid cleaning agent product for textile products according to claim 1 or 2,

wherein the liquid cleaning agent composition for textile products further contains a component (E), and

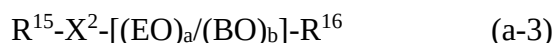
the component (E) is an anionic surfactant.

4. The liquid cleaning agent product for textile products according to any one of claims 1 to 3,

wherein the component (A) includes a compound represented by Formula (a-1) and a compound represented by Formula (a-3),



in Formula (a-1), R^{12} represents a hydrocarbon group having 8 to 18 carbon atoms, X represents -O- or -C(O)O-, and R^{13} represents a hydrogen atom, an alkyl group having 1 to 6 carbon atoms, or an alkenyl group having 2 to 6 carbon atoms; s represents an average repeating number of EO, which is 3 to 20; t represents an average repeating number of PO, which is 0 to 6; and EO represents an oxyethylene group, PO represents an oxypropylene group, and EO and PO may be irregularly arranged,



in Formula (a-3), R^{15} represents a monovalent hydrocarbon group having 8 to 24 carbon atoms, X^2 represents -O-, -C(O)O-, or -C(O)NH-, R^{16} represents a hydrogen atom, an alkyl group having 1 to 6 carbon atoms, or an alkenyl group having 2 to 6 carbon atoms, a represents an average repeating number of EO, which is 1 to 30, b represents an average repeating number of BO, which is 1 to 20, EO represents an oxyethylene group, BO represents an oxybutylene group, and EO and BO may be irregularly arranged.

5. The liquid cleaning agent product for textile products according to any one of claims 1 to 4,

wherein a mass ratio represented by the component (A) / the component (B) is 1.6 or more.

6. The liquid cleaning agent product for textile products according to any one of claims 1 to 4,

wherein the liquid cleaning agent composition for textile products is free of hydrogen peroxide.

7. A cleaning method of textile products comprising:

a step of bringing a textile product to which p-cresol is attached into contact with a cleaning liquid obtained by diluting the liquid cleaning agent composition for textile products stored in the flexible container in the liquid cleaning agent product for textile products according to any one of claims 1 to 6.