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(54) **Title:**
HARD SURFACE LIQUID CLEANER COMPOSITION

(57) **Abstract:**
A hard surface liquid cleaner composition containing (a) a polyalkylene glycol monoalkyl ether, (b) amine oxide, (c) at least one type selected from a group consisting of C8-18 aliphatic acids and salts thereof in the amount of 0.001-15 mass%, and water. The mass ratio of (c)/((b)+(c)) is 0.001/1-1/1. 60-100 mass% of the (a) component is a dipropylene glycol (C4-8 alkyl group) monoalkyl ether. The pH at 25°C is 8-14. This hard surface liquid cleaner composition not only exhibits strong cleaning power against cooking oil buildup, but also remains in a uniform liquid state with no turbidity or separation, and furthermore, has the effect of exhibiting excellent wiping and rinsing properties of a cleaner.

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— 国際調査報告（条約第 21 条(3)）

(54) **Title**: HARD SURFACE LIQUID CLEANER COMPOSITION

(54) 発明の名称 : 硬質表面用液体洗浄剤組成物

(57) **Abstract**: A hard surface liquid cleaner composition containing (a) a polyalkylene glycol monoalkyl ether, (b) amine oxide, (c) at least one type selected from a group consisting of C8-18 aliphatic acids and salts thereof in the amount of 0.001-15 mass%, and water. The mass ratio of (c)/((b)+(c)) is 0.001/1-1/1. 60-100 mass% of the (a) component is a dipropylene glycol (C4-8 alkyl group) monoalkyl ether. The pH at 25°C is 8-14. This hard surface liquid cleaner composition not only exhibits strong cleaning power against cooking oil buildup, but also remains in a uniform liquid state with no turbidity or separation, and furthermore, has the effect of exhibiting excellent wiping and rinsing properties of a cleaner.

(57) 要約: （ａ）ポリアルキレングリコールのモノアルキルエーテル、（ｂ）アミンオキサイド、（ｃ）炭素数が８～１８の脂肪酸及びその塩からなる群から選ばれる１種以上を０．００１～１５質量%、並びに水を含有し、（ｃ）成分／（（ｂ）成分＋（ｃ）成分）の質量比が０．００１／１～１／１であり、（ａ）成分の６０～１００質量%がジプロピレングリコールのアルキル基の炭素数が４～８のモノアルキルエーテルであり、２５℃でのｐＨが８～１４である、硬質表面用液体洗浄剤組成物。本発明の硬質表面用液体洗浄剤組成物は、調理油汚れに対して高い洗浄力を有するだけでなく、濁りや分離のない均一液体相として存在し、なおかつ洗剤の優れた拭き取り性や優れたすすぎ性を発揮する効果を有している。

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DESCRIPTION

TITLE OF THE INVENTION: HARD SURFACE LIQUID CLEANER COMPOSITION

TECHNICAL FIELD

[0001] The present invention relates to a cleaning agent composition for hard surfaces.

BACKGROUND ART

[0002] Generally, as cleaning agents for hard surfaces, in order to remove different stains on subjects to be treated in bathrooms, kitchens, floors and the like, compositions suitable for each of the stains to be treated have been used. For example, as the kitchen cleaning agents usable in areas around the kitchen such as stove ranges, ovens, walls or floors of areas around the stove ranges, and exhaust fans, cleaning agents containing a surfactant, a solvent, an alkalizing agent or the like have been used, in order to remove grease stains deteriorated by an action of heat, sunlight, oxygen in the air or the like. In addition, as bathroom cleaning agents usable in bathrooms including areas such as bathtubs, and walls or floors of bathrooms, cleaning agents containing a surfactant, a solvent, a metal sequestering agent or the like have been used, in order to remove stains originated from metal soaps, particularly calcium salts of fatty acids.

[0003] Among these cleaning agents, the cleaning agents usable in kitchen are applied to a part of hard surfaces of the walls of areas around the stove

ranges, kitchen counters or the like. After the cleaning agents are applied to the hard surfaces, the agents serve to remove stains from greases, dusts and the like, while at the same time spreading over a wide range using tools such as towels and sponges, and at the same time. The grease smokes generated by daily cooking works deposit to the hard surfaces of the walls of areas around the stove ranges, kitchen counters, or the like, and many of these stains exist in the state that would not hardly undergo any deteriorations due to oxidation or heat if only for a period of a week or so. In order to remove the cooking grease stains as mentioned above, it is necessary to utilize solubilizing strength or emulsifying property of surfactants, dissolving strength or swelling strength of solvents, and the like. A solvent a monoalkyl(4 to 8 carbon atoms) ether of dialkylene(2 to 4 carbon atoms) glycol, especially a monoalkyl ether of dipropylene glycol, of which alkyl group has 4 to 8 carbon atoms, has excellent removability of cooking grease stains having a low degree of deterioration mentioned above, and a cleaning agent blended with this solvent has been desired. Since the above solvent does not dissolve in water alone, a two-layer separation system would be undesirably formed in the absence of a surfactant, thereby making it awfully inconvenient in use of the above solvent.

[**0004**] Patent Document 1 discloses a cleaning agent composition for hard surfaces which shows excellent cleaning power against stubborn deteriorated grease stains, containing dipropylene glycol monobutyl ether as a glycolic solvent. However, the patent document does not suggest at all on the removability of cooking grease stains having a low degree of

deterioration.

[0005] Patent Document 2 discloses a liquid cleaning agent composition for air conditioner fins, containing a glycolic solvent dipropylene glycol monobutyl ether, and a surfactant. However, the patent document does not suggest on the cleaning effects and working facilitation against grease stains in the kitchen.

[0006] Patent Document 3 discloses a cleaning agent composition for hard surfaces, containing a nonionic surfactant, dipropylene glycol monobutyl ether as a hydrophobic solvent, and an anionic surfactant. However, the patent document does not suggest at all on the removability of cooking grease stains having a low degree of deterioration.

[0007] Patent Document 4 discloses a phase-stable liquid wiper refreshing composition, containing a solvent such as butoxypropoxy propanol. However, the patent document does not suggest at all on the removability of cooking grease stains having a low degree of deterioration.

PRIOR ART REFERENCES

PATENT PUBLICATIONS

[0008] Patent Publication 1: Japanese Patent Laid Open No. 2008-45108

Patent Publication 2: Japanese Patent Laid Open No. 2000-290699

Patent Publication 3: WO 93/04151

Patent Publication 4: Japanese Unexamined Patent Publication No. Hei-11-511800

SUMMARY OF THE INVENTION

MEANS TO SOLVE THE PROBLEMS

[0009] As a result of intensive studies, the present inventor has found that in a composition containing, as essential components, a monoalkyl ether of a polyalkylene glycol represented by the following formula (a1) [a component (a)], an amine oxide [a component (b)], and one or more surfactants selected from fatty acids having 8 to 18 carbon atoms and salts thereof [a component (c)], provided that the mass of the salt in the component (c) is calculated as the mass in an acid form hereinafter, wherein a mass ratio of the component (c) / (the component (b) + the component (c)) is from 0.001/1 to 1/1, and wherein 60 to 100% by mass of the component (a) is a monoalkyl ether of dipropylene glycol, of which alkyl group has 4 to 8 carbon atoms [a component (a-1)], the composition forms a homogenous liquid phase without turbidity or separation, and has excellent cleaning power against grease stains and storage stability, and the composition exhibits excellent cleaning ability especially against cooking grease stains having a low degree of deterioration. The present invention has been perfected thereby.

[0010] $R^{1a}(OR^{2a})_lOH$ (a1)

In the formula, R^{1a} is an alkyl group having 4 to 8 carbon atoms, l is a number of from 1 to 4, and R^{2a} is an alkylene group having 2 to 4 carbon atoms.

[0011] The present invention relates to the provision of a compound capable of forming a homogenous liquid composition with a surfactant in as a small amount as possible, in a cleaning agent composition for hard surfaces having excellent cleaning power against cooking grease stains, the

cleaning agent composition being blended with a monoalkyl ether of a polyalkylene glycol of which alkylene group has 2 to 4 carbon atoms and of which alkyl group has 4 to 8 carbon atoms.

[**0012**] Further, the present invention relates to the provision of a liquid cleaning agent composition for hard surfaces, having excellent cleaning ability against cooking grease stains, being capable of forming a homogenous liquid phase free from turbidity or separation, and having more convenient operability in a rinsing process of a cleaning agent, part of the cleaning process.

[**0013**] Further, the present invention relates to the provision of a liquid cleaning agent composition for hard surfaces which exhibits excellent cleaning ability especially against cooking grease stains having a low degree of deterioration.

[**0014**] The liquid cleaning agent composition for hard surfaces of the present invention exhibits some effects of not only having high cleaning power against cooking grease stains but also having excellent wiping ability and excellent rinsability of the cleaning agent, as being present in the form of a homogeneous liquid phase without turbidity or separation. The liquid cleaning agent composition for hard surfaces of the present invention can be applied to various kinds of hard surfaces, and the composition is especially suitable for hard surfaces in the kitchen areas, so that the composition is suitable as a kitchen liquid cleaning agent composition. Since the liquid cleaning agent composition for hard surfaces of the present invention exhibits excellent cleaning ability against grease stains having a low degree of deterioration, the composition can be

preferably applied to hard surfaces in the kitchen areas where the grease stains as mentioned above exist in large amounts. Here, the state that a composition "is present in the form of a homogeneous liquid phase" as used herein refers to a state of the composition in which turbidity or separation cannot be visually confirmed after stirring a composition and allowing it to stand at room temperature (for example, 25°C) for 1 hour.

MODES FOR CARRYING OUT THE INVENTION

[**0015**] The liquid cleaning agent composition for hard surfaces of the present invention contains, as a component (a), a monoalkyl ether of a polyalkylene glycol represented by the following formula (a1). The content of the component (a) is preferably from 1 to 15% by mass, more preferably from 1.5 to 8% by mass, and even more preferably from 2 to 6% by mass, of the composition of the present invention, from the viewpoint of cleaning power against grease stains and storage stability, and especially from the viewpoint of cleaning power. The content is preferably 1% by mass or more, more preferably 1.5% by mass or more, and even more preferably 2% by mass or more, from the viewpoint of cleaning power against grease stains, and the content is preferably 15% by mass or less, more preferably 8% by mass or less, and even more preferably 6% by mass or less, from the viewpoint of storage stability. R^{1a} in the formula (a1) includes a butyl group, an isobutyl group, a hexyl group, a 2-ethylhexyl group, and the like, preferably a butyl group and a hexyl group, and more preferably a butyl group, from the viewpoint of cleaning power against grease stains and storage stability. R^{2a} in the

formula (a1) is preferably an ethylene group, a propylene group, or a butylene group, and more preferably a propylene group, from the viewpoint of cleaning power against grease stains and storage stability. Further, l is the number of from 1 to 4, more preferably the number of from 2 to 3, and even more preferably the number of 2, from the viewpoint of cleaning power against grease stains and storage stability.

[**0016**] $R^{1a}(OR^{2a})_lOH$ (a1)

In the formula, R^{1a} is an alkyl group having 4 to 8 carbon atoms, l is the number of from 1 to 4, and R^{2a} is an alkylene group having 2 to 4 carbon atoms.

[**0017**] Further, the component (a) is preferably (a-1) a monoalkyl ether of dipropylene glycol of which alkyl group has 4 to 8 carbon atoms, from the viewpoint of cleaning power against grease stains and storage stability, more preferably dipropylene glycol monobutyl ether, dipropylene glycol monoisobutyl ether, dipropylene glycol monohexyl ether, or dipropylene glycol mono(2-ethylhexyl) ether, even more preferably dipropylene glycol monobutyl ether, dipropylene glycol monoisobutyl ether, or dipropylene glycol monohexyl ether, still even more preferably dipropylene glycol monobutyl ether or dipropylene glycol monohexyl ether, and especially preferably dipropylene glycol monobutyl ether. The component (a) may be a single compound or a mixture of plural compounds, and the component (a-1) is contained in an amount of from 60 to 100% by mass, preferably from 80 to 100% by mass, more preferably from 90 to 100% by mass, and even more preferably 100% by mass, of the component (a), from the viewpoint of cleaning power against grease stains.

[0018] The liquid cleaning agent composition for hard surfaces of the present invention contains, as a component (b), an amine oxide. The content of the component (b) is preferably from 0.05 to 15% by mass, more preferably from 0.1 to 5% by mass, even more preferably from 0.5 to 3.5% by mass, and still even more preferably from 1 to 2% by mass, of the composition of the present invention. The content is preferably 0.05% by mass or more, more preferably 0.1% by mass or more, even more preferably 0.5% by mass or more, and still even more preferably 1% by mass or more, from the viewpoint of storage stability, and the content is preferably 15% by mass or less, more preferably 5% by mass or less, even more preferably 3.5% by mass or less, and still even more preferably 2% by mass or less, from the viewpoint of residuality of the component on an object to be cleaned.

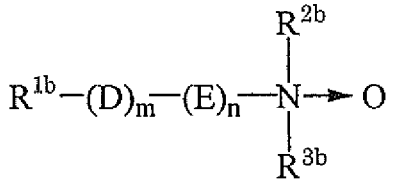
[0019] A mass ratio of the component (a) to a total amount of the component (b) and a component (c) described later, i.e. (a) / ((b) + (c)) of preferably from 1/1 to 15/1, more preferably from 1.1/1 to 5/1, and even more preferably from 1.2/1 to 3/1. The mass ratio is preferably 1/1 or more, more preferably 1.1/1 or more, and even more preferably 1.2/1 or more, from the viewpoint of cleaning power against grease stains. The mass ratio is preferably 15/1 or less, more preferably 5/1 or less, and even more preferably 3/1, from the viewpoint of high-temperature storage stability.

[0020] The amine oxide of the component (b) includes, for example, as the followings.

[0021] The component includes an alkyl- or alkenylamine oxide having a

hydrocarbon group, preferably a linear or branched alkyl group or alkenyl group, and preferably an alkyl group, having 8 to 18 carbon atoms, from the viewpoint of cleaning power against grease stains. A more preferred amine oxide includes an alkyl- or alkenylamine oxide represented by the following general formula (b1):

[0022]



(b1)

[0023] wherein R^{1b} is a hydrocarbon group, preferably an alkyl group or alkenyl group, and preferably an alkyl group, having 8 to 18 carbon atoms, each of R^{2b} and R^{3b}, which may be identical or different, is an alkyl group having 1 to 3 carbon atoms, D is an -NHC(=O)- group or a -C(=O)NH- group, E is an alkylene group having 1 to 5 carbon atoms, m and n are m=0 and n=0, or m=1 and n=1.

[0024] In the above general formula (b1), R^{1b} is an alkyl group or alkenyl group having 8 to 18 carbon atoms, from the viewpoint of cleaning power against grease stains, and preferably an alkyl group having 10 to 16 carbon atoms, more preferably an alkyl group having 12 to 14 carbon atoms, and even more preferably an alkyl group having 12 carbon atoms. Each of R^{2b} and R^{3b} is an alkyl group having 1 to 3 carbon atoms, and more preferably a methyl group having 1 carbon atom.

[0025] Preferred examples of the alkyl- or alkenylamine oxide represented by the general formula (b1) include an alkyl(8 to 18 carbon

atoms)dialkyl(1 to 3 carbon atoms)amine oxide, from the viewpoint of cleaning power against grease stains. Specific examples thereof include, for example, caprylyldimethylamine oxide, capryldimethylamine oxide, lauryldimethylamine oxide, myristyldimethylamine oxide, and the like. Further, lauric acid amide propyldimethylamine oxide, myristic acid amide propyldimethylamine oxide, palmitic acid amide propyldimethylamine oxide, and the like are included in the preferred examples. Further lauroylamidopropyldimethylamine oxide is also a preferred example.

[0026] The liquid cleaning agent composition for hard surfaces of the present invention contains, as a component (c), one or more members selected from the group consisting of fatty acids having 8 to 18 carbon atoms and salts thereof.

[0027] The number of carbon atoms of the fatty acids in the component (c) is from 8 to 18, preferably from 12 to 18, and more preferably from 14 to 16.

[0028] Specific examples of the fatty acids in the component (c) include caprylic acid, capric acid, lauric acid, myristic acid, palmitic acid, stearic acid, oleic acid, linoleic acid, linolenic acid, and the like.

[0029] The counterion in the case where the component (c) is a salt of the fatty acid is suitably sodium, potassium, magnesium, calcium, an alkanolamine, or ammonium, and the counterion is preferably sodium, potassium, or an alkanolamine, from the viewpoint of cleaning power against grease stains. Therefore, preferred specific examples of the salts of the fatty acids include sodium laurate, sodium myristate, monoethanolamine myristate, and the like.

[0030] The content of the component (c) is from 0.001 to 15% by mass, preferably from 0.001 to 3.5% by mass, more preferably from 0.005 to 1% by mass, and even more preferably from 0.1 to 0.5% by mass, of the liquid cleaning agent composition for hard surfaces of the present invention. The content is 0.001% by mass or more, preferably 0.05% by mass, and more preferably 0.1% by mass or more, from the viewpoint of high-temperature stability and rinsability, and the content is 15% by mass or less, preferably 3.5% by mass or less, more preferably 1% by mass or less, and even more preferably 0.5% by mass or less, from the viewpoint of cleaning ability.

[0031] The component (c) has some effects of not only allowing the composition of the present invention to form a stable homogeneous liquid phase under operable conditions, but also improving rinsability of the cleaning agent in the cleaning process. Further, a mass ratio of the component (c) to a total amount of the component (b) and the component (c), i.e. (c) / ((b) + (c)), is from 0.001/1 to 1/1, preferably from 0.003/1 to 0.6/1, more preferably from 0.0033/1 to 0.5/1, more preferably from 0.01/1 to 0.5/1, more preferably from 0.03/1 to 0.4/1, more preferably from 0.1/1 to 0.33/1, more preferably from 0.1/1 to 0.3/1, and even more preferably from 0.17/1 to 0.29/1, from the viewpoint of cleaning power against grease stains.

[0032] Although the causes why high-temperature stability and rinsability of the composition are improved by blending the component (c) are not elucidated, the mechanisms which are possibly considered will be explained hereinbelow.

[0033] A dipolar force, a main interaction between a hydrophilic group of

the component (b) and water, is reduced with a temperature increase. Accordingly, with the temperature increase, the component (b) has a tendency of causing phase separation with water. In that case, the component (b) would not be able to solubilize the component (a) as a surfactant.

[**0034**] Meanwhile, oxygen of the amine oxide moiety of the component (b) is electron-attractive, so that it is considered that nitrogen atom located adjacent to the oxygen in a hydrophilic group of the component (b) is slightly positively charged. Therefore, it is considered that there is a weak electric interaction between the component (b) and the component (c) having a carboxylic acid moiety. For this reason, if the composition is blended with the component (c), the component (b) would be less likely to cause phase separation with water, so that it is considered that the component (b) is capable of functioning as a surfactant, whereby the separation of the component (a) and the component (b) from water, which can be caused during the temperature increase can be suppressed.

[**0035**] Supposing the above mechanisms, as one of the properties of the component (c), the presence of a hydrophobic group having an enough length to be capable of forming mixed micelles is considered to be important. This hypothesis is deduced from the matter that a carboxylic acid having a hydrophobic group only containing an alkyl group having 6 or less carbon atoms or an aryl group having 10 or less carbon atoms, including, for example, acids such as citric acid, propionic acid, and benzoic acid, and salts thereof, has a tendency of a weaker effect as the component (c) in the present invention.

[0036] In addition, the component (c) interacts with calcium ions contained in tap water to have a defoaming action. This effect is an action specific to a fatty acid having 8 to 18 carbon atoms or a salt thereof, and a substance which is common in the aspect of having a carboxyl group, such as a polyoxyethylene alkyl ether carboxylic acid or a salt thereof, or a polyoxyethylene amide alkyl ether carboxylic acid or a salt thereof, does not have the above effect. The component (c) closely interacts with the component (a) and the component (b) to contribute to solution stability of the composition. If the component (c) is lost from a mixed micelle due to calcium in tap water, a solution structure quickly disintegrate, which is deduced to be changed into a solution having low-foaming property.

[0037] In a general method of using a kitchen cleaning agent, a cleaning agent is applied to hard surfaces with a tool such as a sprayer, a sponge, a towel, a duster, a nonwoven fabric, or paper, stains are wiped away with a wipe-off tool, and then a rinsing procedure is carried out with tap water. Conventional techniques have been reviewed and studied for optimization from the viewpoint of cleaning performance, but does not take convenience in a rinsing operation after cleaning into consideration. The present technique provides a one-step advanced value in realizing high cleaning performance and at the same time reducing rinsing operational burdens after cleaning.

[0038] It is preferable that the liquid cleaning agent composition for hard surfaces of the present invention contains, as a component (d), an alkanolamine and/or an alkali hydroxide, from the viewpoint of further improving cleaning performance. The alkanolamine includes

monoethanolamine, diethanolamine, and triethanolamine, and the alkanolamine is more preferably monoethanolamine, from the viewpoint of cleaning power against grease stains. The alkali hydroxide as used herein refers to a hydroxide of an alkali metal or alkaline earth metal. The alkali hydroxide includes sodium hydroxide, potassium hydroxide and the like.

[0039] The content of the component (d) is preferably from 0.01 to 20% by mass, more preferably from 0.05 to 17% by mass, more preferably from 1.5 to 15% by mass, more preferably from 2 to 10% by mass, even more preferably from 3 to 7% by mass, and even more preferably from 5 to 6% by mass, of the liquid cleaning agent composition for hard surfaces of the present invention, in order to give sufficient cleaning power to the grease stains. The component (d) may be a single compound or a mixture of plural compounds.

[0040] The liquid cleaning agent composition for hard surfaces of the present invention can contain, as a component (e), a builder component, from the viewpoint of further improving cleaning performance. As the builder component, one or more members listed hereinbelow can be used.

[0041] (1) An alkali metal salt or alkanolamine salt of an aminopolyacetic acid, the aminopolyacetic acid including nitrilotriacetic acid, iminodiacetic acid, ethylenediaminetetraacetic acid, hydroxyethylethylenediaminetriacetic acid, diethylenetriaminepentaacetic acid, glycol ether diaminetetraacetic acid, hydroxyethyliminodiacetic acid, triethylenetetraminehexaacetic acid, djenkolic acid, or the like.

[0042] (2) An alkali metal salt or alkanolamine salt of an organic acid,

the organic acid including diglycolic acid, oxydisuccinic acid, carboxymethyloxysuccinic acid, carboxymethylsuccinic acid, carboxymethyltartaric acid, citric acid, lactic acid, tartaric acid, oxalic acid, malic acid, gluconic acid or the like.

[0043] Among them, citric acid, malic acid, ethylenediaminetetraacetic acid, hydroxyethylethylenediaminetriacetic acid, or a salt thereof is preferred. The form of the salt is preferably a sodium salt, a potassium salt, an ammonium salt, or an alkanolamine salt.

[0044] The content of the component (e) is preferably from 0.01 to 5% by mass, more preferably from 0.1 to 3% by mass, and even more preferably from 0.2 to 1% by mass, of the composition, from the viewpoint of cleaning power against grease stains.

[0045] The liquid cleaning agent composition for hard surfaces of the present invention can be blended with, in addition to the above components, other components within the range that would not impair the objects or effects of the present invention. Other components include, for example, surfactants such as polyoxyethylene alkyl ethers and alkyl (poly)glycosides; solvents such as ethanol, propanol, glycerol, ethylene glycol, propylene glycol, propylene glycol monomethyl ether, an alkyl monoglyceryl ether of which alkyl group has 3 to 8 carbon atoms, and a polyoxyethylene phenyl ether or benzyl ether, of which EO has the number of moles added of from 1 to 5 on average; antioxidants such as BHT; bactericidal and mildewproof agents; and anti-corrosive agents. Here, the liquid cleaning agent composition for hard surfaces of the present invention can be blended, as an optional component, with a polyacrylic

acid and a salt thereof, a copolymer formed between an olefin and maleic anhydride, and others such as a dispersant, including a carboxylate polymer or a sulfonate polymer described in the paragraphs 0035 to 0038 of Japanese Patent Laid-Open No. Hei-7-292398.

[0046] The polyoxyethylene alkyl ethers include those listed in the following (1) or (2):

(1) A polyoxyethylene alkyl ether or alkenyl ether, of which alkyl group or alkenyl group has the number of carbon atoms of from 10 to 18, and preferably from 10 to 16, on average, from the viewpoint of cleaning power against grease stains, and of which ethylene oxide (hereinafter simply referred to as EO) has the number of moles added of from 1 to 30 mol on average, and preferably from 6 to 20 on average. Preferred examples of the above (1) include a polyoxyethylene linear alkyl ether of which alkyl group has 8 to 18 carbon atoms.

[0047] (2) A polyoxyethylene alkylphenyl ether, of which alkyl group has the number of carbon atoms of from 6 to 12 on average, from the viewpoint of cleaning power against grease stains, and of which EO has the number of moles added of from 1 to 25 mol on average.

[0048] The alkyl (poly)glycoside includes an alkyl (poly)glycoside represented by the following general formula (b2), from the viewpoint of cleaning power against grease stains.

[0049] $R^{4b}(OR^{5b})_xG_y$ (b2)

wherein R^{4b} is a linear or branched alkyl group, alkenyl group or alkylphenyl group, having a total number of carbon atoms of from 8 to 18, R^{5b} is an alkylene group having 2 to 4 carbon atoms, G is a residue

originated from a reducing sugar having 5 to 6 carbon atoms, x is from 0 to 5, and y is from 1 to 5.

[0050] In the liquid cleaning agent composition for hard surfaces of the present invention, water is blended together with each of the components mentioned above. The amount of water blended is an amount so that a total amount is adjusted to 100% by mass. In other words, the balance of the composition is water. The amount of water is preferably from 70 to 98% by mass, more preferably from 75 to 96% by mass, and even more preferably from 80 to 94% by mass, of the composition, from the viewpoint of cleaning power against grease stains and high-temperature stability. In addition, the liquid cleaning agent composition for hard surfaces of the present invention has a pH at 25°C of from 8 to 14, from the viewpoint of cleaning power against grease stains and ensuring of safety during use. The composition has preferably a pH of 8.5 or more, more preferably a pH of 9 or more, even more preferably a pH of 10 or more, and still even more preferably a pH of 11 or more, in order to obtain a high cleaning power. On the other hand, the composition has preferably a pH of 14 or less, more preferably a pH of 13 or less, more preferably a pH of 12 or less, and even more preferably a pH of 11.5 or less, from the viewpoint of ensuring safety during use. In other words, the liquid cleaning agent composition for hard surfaces of the present invention has a pH at 25°C of preferably from 8.5 to 14, more preferably from 9 to 13, even more preferably from 10 to 12, and still even more preferably from 11 to 11.5. The pH is measured with a pH meter D-52S and a pH electrode 6367-10D both manufactured by HORIBA, Ltd.

[0051] The liquid cleaning agent composition for hard surfaces of the present invention can be produced by mixing each of the components in proper amounts.

[0052] The present invention relates to a liquid cleaning agent composition in which hard surfaces are subject to be cleaned. Here, the term "hard surfaces" means those surfaces having given shapes, irrespective of being two-dimensional or three-dimensional, and the degree of hardness is not limited so long as the surfaces can be subjected to a cleaning treatment. The hard surfaces include fixed objects such as floors, staircases, and walls made of plastics, rubbers, metals, tiles, bricks, concrete, cement, glass, wood, and the like, as well as generally any surfaces humans contact, such as various instruments, appliances, tools, furniture, and dishware made of those listed, and more preferably including those made of plastics, metals, glass, and the like.

[0053] Accordingly, the liquid cleaning agent composition for hard surfaces of the present invention can be applied as kitchen cleaning agents, bathroom cleaning agents, floor cleaning agents, dishware cleaning agents, cleaning agents for fully automatic washing machine wash tubs, small article cleaning agents for kitchens and toilets, and the like, and more preferably can be applied as kitchen cleaning agents.

[0054] The embodiments of the present invention will be exemplified hereinbelow:

[1] A liquid cleaning agent composition for hard surfaces, containing:

(a) a monoalkyl ether of a polyalkylene glycol represented by

the following formula (a1):

$$R^{1a}(OR^{2a})_lOH \qquad (a1)$$

wherein R^{1a} is an alkyl group having 4 to 8 carbon atoms, l is the number of from 1 to 4, preferably the number of 2 to 3, and more preferably the number of 2, and R^{2a} is an alkylene group having 2 to 4 carbon atoms, and preferably a propylene group;

(b) an amine oxide;

(c) one or more members selected from the group consisting of fatty acids having 8 to 18 carbon atoms and salts thereof in an amount of from 0.001 to 15% by mass, preferably from 0.001 to 3.5% by mass, more preferably from 0.005 to 1% by mass, and more preferably from 0.1 to 0.5% by mass, provided that the mass in a case of a salt is calculated as the mass in an acid form; and

water,

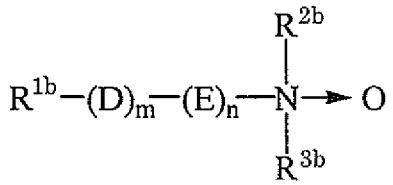
wherein a mass ratio of the component (c) / (the component (b) + the component (c)) is from 0.001/1 to 1/1, and wherein 60 to 100% by mass, preferably from 80 to 100% by mass, more preferably from 90 to 100% by mass, and more preferably 100% by mass of the component (a) is a monoalkyl ether of dipropylene glycol (a-1) of which alkyl group has 4 to 8 carbon atoms,

wherein its pH at 25°C is from 8 to 14.

[2] The composition according to the above [1], wherein a mass ratio of the component (a) / (the component (b) + the component (c)) is from 1/1 to 15/1, preferably from 1.1/1 to 5/1, and more preferably from 1.2/1 to 3/1.

[3] The composition according to the above [1] or [2], wherein the component (b) is an alkylamine or alkenylamine oxide represented by the following general formula (b1):

[0055]



(b1)

[0056] wherein R^{1b} is a hydrocarbon group, preferably an alkyl group or alkenyl group, and more preferably an alkyl group, having 8 to 18 carbon atoms, each of R^{2b} and R^{3b}, which may be identical or different, is an alkyl group having 1 to 3 carbon atoms, D is an -NHC(=O)- group or a -C(=O)NH- group, E is an alkylene group having 1 to 5 carbon atoms, and m and n are m=0 and n=0, or m=1 and n=1.

[4] The composition according to any one of the above [1] to [3], wherein the component (b) is an alkyldimethylamine oxide, of which alkyl group has the number of carbon atoms of 8 to 18, preferably 12 to 18, and more preferably 14 to 16.

[5] The composition according to any one of the above [1] to [4], wherein the composition further contains, as a component (d), an alkanolamine, and preferably monoethanolamine, and/or an alkali hydroxide in an amount of from 0.01 to 20% by mass, preferably from 0.05 to 17% by mass, more preferably from 1.5 to 15% by mass, more preferably from 2 to 10% by mass, more preferably from 3 to 7% by mass, and more preferably from 5 to 6% by mass.

[6] The composition according to any one of the above [1] to [5], wherein the component (a-1) is dipropylene glycol monobutyl ether.

[0057] [7] The composition according to any one of the above [1] to [6], wherein the component (b) is contained in an amount of from 0.05 to 15% by mass, preferably from 0.1 to 5% by mass, more preferably from 0.5 to 3.5% by mass, and more preferably from 1 to 2% by mass.

[8] The composition according to any one of the above [1] to [7], wherein the component (a) consists of a component (a-1).

[9] The composition according to any one of the above [1] to [8], wherein the component (a) is contained in an amount of from 1 to 15% by mass, preferably from 1.5 to 8% by mass, and more preferably from 2 to 6% by mass.

[10] The composition according to any one of the above [1] to [9], wherein a mass ratio of the component (c) / (the component (b) + the component (c)) is from 0.03/1 to 0.6/1, preferably from 0.0033/1 to 0.5/1, more preferably from 0.01/1 to 0.5/1, more preferably from 0.03/1 to 0.4/1, more preferably from 0.1/1 to 0.33/1, more preferably from 0.1/1 to 0.3/1, and more preferably from 0.17/1 to 0.29/1.

[11] The composition according to any one of the above [1] to [10], wherein water is contained in an amount of from 70 to 98, preferably from 75 to 96% by mass, and more preferably from 80 to 94% by mass.

[12] The composition according to any one of the above [1] to [11], wherein the composition has a pH at 25°C of from 8.5 to 14, more preferably from 9 to 13, more preferably from 10 to 12, and more preferably from 11 to 11.5.

[13] The composition according to any one of the above [1] to [12], wherein the composition is present in the form of a homogeneous liquid phase.

[14] The composition according to any one of the above [1] to [13], wherein the composition is applicable as a kitchen cleaning agent.

[15] A cleaning method including applying the composition as defined in any one of the above [1] to [14] to a hard surface on which grease stains are present to clean the hard surface.

EXAMPLES

[0058] Examples 1 to 18, and Comparative Examples 1 to 17

The following examples further describe and demonstrate embodiments of the present invention. The examples are given solely for the purposes of illustration and are not to be construed as limitations of the present invention. Each of the liquid cleaning agent compositions for hard surfaces of Examples and Comparative Examples was obtained using each of the components listed in the following tables. The numerical values of the amount of each component in the tables are expressed as % by mass, and the balance was deionized water. The values for the mass ratios in the tables are listed abbreviating the denominator, i.e. abbreviating /1.

[0059] Each of the prepared compositions of Examples and Comparative Examples 1 to 8, and 10 to 17 was present in the form of a homogeneous liquid phase without turbidity or separation. On the other hand, the composition of Comparative Example 9 could not be made into a homogeneous liquid composition, so that the evaluation could not be

carried out. Accordingly, the evaluation for Comparative Example 9 was listed as F. In addition, among the component (b), the compositions of Examples 1, and 3 to 18 each using b-3, b-3', or b-3" were found to have a tendency of exhibiting more excellent cleaning performance as compared to Example 2 using b-4.

[**0060**] The pH of the composition (at 25°C) was adjusted with a 6 N-aqueous sodium hydroxide solution or a 6 N-hydrochloric acid, as occasion demands. Each test for the cloud point, the cleaning performances, and the working facilitation was conducted in accordance with the following methods, using each of the liquid cleaning agent compositions for hard surfaces. The results are shown in the following tables.

[**0061**] (Cloud Point)

For each of the composition stock solutions, the following treatments were carried out. A 50 mL volume glass vessel (Maruemu Corporation, Screw Bottle No. 7) was charged with 40 g of a composition. After immersing this bottle in a water bath temperature-controlled to 15°C ± 2°C for 30 minutes or longer, the temperature of the composition was raised at a rate of 5° to 10°C/min, while repeating the procedures of stirring and immersing the bottle for a short time, i.e. 1 to 10 seconds, in a water bath temperature-controlled to 70°C ± 5°C. The composition inside the bottle was observed, and a temperature at which the composition started becoming turbid was recorded. The same composition was measured 3 times, and the lowest among which was defined as a cloud point of the composition. The higher the cloud point, the more excellent

the stability of the composition. When the temperature during transportation or storage is taken into consideration, one preferred standard is a cloud point of, for example, 50°C or higher.

[0062] (Cleaning Performance I)

A cleaning effect against deteriorated soybean oil stains was evaluated using a composition stock solution.

A 1 g sample was applied to the following stainless steel plate previously coated with deteriorated soybean oil stains so as to be in a circular form having a diameter of about 35 mm. After allowing the sample to contact the plate at room temperature (25° ± 5°C) for 5 minutes, the plate was subjected to rinsing procedure with deionized water. A sample to which the above cleaning procedure was conducted, and the following stainless steel plate (reference) not subjected to the cleaning procedure was photographed with a digital camera. The areas of stain removal parts of the circular part of the sample after rinsing were numerically expressed. In other words, supposing that a case where the stains of the circular part were completely removed was 100 and a case where the stains were not removed at all was 0, the numerical values were converted according to a cleaning ratio corresponding to the area (numerically expressed to the 5% cut).

[0063] [Method for Preparing Deteriorated Soybean Oil Stains]

A commercially available soybean oil (a product of Wako Pure Chemical Industries, Ltd. being used, the product of within 3 months after purchase being used) was added in an amount of 40 mL to a 50 mL stainless steel beaker, and the beaker was heated at 180°C for 1 hour in a

state that the top part was allowed to be in the open air, and then air-cooled naturally to room temperature (25°± 5°C). An oil orange SS was added in an amount of 1 parts by mass, based on 99 parts by weight of this heat-treated oil, and the components were thoroughly mixed at room temperature. The model stains were applied as evenly as possible so as to be in an amount of 1.4 to 1.6 mg per one square centimeter, and allowed to stand at room temperature for one week. The stains were used in the evaluation of cleaning.

[0064] [Method of Digitizing Stain Removal Areas]

The images photographed with the digital camera were subjected to a graying treatment using an image processing software (Win ROOF Ver. 3.30 (MITANI Corporation)). The areas of the stain removal parts were digitized by subjecting processed images to binarization, and counting the stain removal parts. As the threshold value used in the binarization of each of the images, a value in which stained parts of the reference in the images are all not counted was used.

[0065] (Working Facilitation)

Twenty monitors were asked to perform the following cleaning procedures for the compositions listed in the following tables, and rinsing facilitation during the procedure was evaluated in accordance with the following criteria.

[0066] [Cleaning Procedures]

A composition was sprayed three times evenly over a 15 cm x 30 cm stainless steel plate with a sprayer (the one used for Magiclean, manufactured by Kao Corporation, a manufactured article of

2010) in the mode setting of "fine lather." Next, the sprayed cleaning agent was wiped and spread over the entire stainless steel plate using a tightly water-squeezed sponge (Kikulon). The sponge was rinsed under running water (flow rate 100 mL/s), and water was squeezed therefrom, and the stainless steel plate was then cleanly wiped with that sponge.

[0067] [Rinsing Facilitation]

4: the number of monitors who replied as being easily rinsable for the sponge after wiping and spreading was 18 members or more;

3: the number of monitors who replied as being easily rinsable for the sponge after wiping and spreading was from 15 to 17 members;

2: the number of monitors who replied as being easily rinsable for the sponge after wiping and spreading was 10 to 14 members; and

1: the number of monitors who replied as being easily rinsable for the sponge after wiping and spreading was 9 members or less.

[0068] (Cleaning Performance II Using Low-Deterioration Oil)

A commercially available soybean oil (a product of Wako Pure Chemical Industries, Ltd. being used, the product of within 3 months after purchase being used) was added in an amount of 40 mL to a 50 mL stainless steel beaker, and the beaker was heat-treated at 180°C for 50 hours (using an electric thermostat) in a state that the top part was allowed to be in the open air, and then air-cooled naturally to room temperature. An oil orange SS was added in an amount of 1 parts by mass, based on 99 parts by weight of this heat-treated oil, and the components were thoroughly mixed at room temperature (25°± 5°C). The model stains were applied as evenly as possible so as to be in an amount of 1.4 to 1.6 mg per

one square centimeter, and the stains were immediately used in the evaluation of cleaning, in the same manner as above.

[0069]

[Table 1]

Table 1

Examples			1	2	3	4	5	6	7	8	9
Component (a)	Component (a-1)	a-1-1	2.50	2.50	3.50	3.50	3.50	3.50	3.50	3.50	-
		a-1-2	-	-	-	-	-	-	-	-	2.00
	a-2		-	-	-	-	-	-	-	-	-
a-1/a			1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Component (b)	b-3		1.00	-	1.50	1.50	1.50	1.50	1.50	1.50	1.20
	b-3'		-	-	-	-	-	-	-	-	-
	b-3"		-	-	-	-	-	-	-	-	-
	b-4		-	1.00	-	-	-	-	-	-	-
Component (c)	c-1		-	-	0.300	-	-	-	-	-	-
	c-2		-	-	-	0.300	-	-	-	-	-
	c-3		0.500	0.500	-	-	0.300	-	-	-	0.500
	c-4		-	-	-	-	-	0.300	-	-	-
	c-5		-	-	-	-	-	-	0.300	-	-
	c-6		-	-	-	-	-	-	-	0.300	-
Component (d)	Monoethanolamine		5.00	5.00	5.00	5.00	5.00	5.00	5.00	5.00	7.00
Numerical Conditions	a/(b+c)		1.7	1.7	1.9	1.9	1.9	1.9	1.9	1.9	1.2
	c/(b+c)		0.33	0.33	0.17	0.17	0.17	0.17	0.17	0.17	0.29
pH			11.5	11.5	11.5	11.5	11.5	11.5	11.5	11.5	11.5
Cloud Point (°C)			>60	>60	>60	>60	>60	>60	>60	>60	>62
Cleaning Performance I			95	85	95	95	95	95	95	95	95
Working Facilitation			4	4	3	3	4	4	3	4	4
Cleaning Performance II			95	95	95	95	95	95	95	95	90

(Continued)

(Continued)

Examples			10	11	12	13	14	15	16	17	18
Component (a)	Component (a-1)	a-1-1	3.50	3.50	7.00	2.50	10.0	3.50	2.50	2.50	3.50
		a-1-2	-	-	-	-	-	-	-	-	-
	a-2		-	-	-	-	-	2.00	-	-	-
a-1/a			1.00	1.00	1.00	1.00	1.00	0.640	1.00	1.00	1.00
Component (b)	b-3		1.50	1.50	3.50	0.100	3.00	1.50	-	-	1.50
	b-3'		-	-	-	-	-	-	1.00	-	-
	b-3"		-	-	-	-	-	-	-	1.00	-
	b-4		-	-	-	-	-	-	-	-	-
Component (c)	c-1		-	-	-	-	-	-	-	-	-
	c-2		-	-	-	-	-	-	-	-	-
	c-3		0.00500	0.100	3.50	0.100	0.500	0.100	0.500	0.500	0.300
	c-4		-	-	-	-	-	-	-	-	-
	c-5		-	-	-	-	-	-	-	-	-
	c-6		-	-	-	-	-	-	-	-	-
Component (d)	Monoethanolamine		5.00	5.00	5.00	5.00	5.00	5.00	5.00	5.00	0.05
Numerical Conditions	a/(b+c)		2.3	2.2	1.0	13	2.9	2.2	1.7	1.7	1.9
	c/(b+c)		0.0033	0.06	0.50	0.50	0.14	0.06	0.33	0.33	0.17
pH			11.5	11.5	11.5	11.5	11.5	11.5	11.5	11.5	8.5
Cloud Point (°C)			51	>60	>60	>60	>60	>60	>60	>60	>60
Cleaning Performance I			95	95	90	90	95	95	95	95	90
Working Facilitation			4	4	4	4	3	4	4	4	4
Cleaning Performance II			95	95	95	90	95	95	95	95	95

[0070]

[Table 2]

Table 2

Comparative Examples		1	2	3	4	5	6	7
Component (a)	Component (a-1) a-1-1	2.50	2.50	2.50	2.50	2.50	-	-
	a-2	-	-	-	-	-	-	2.50
Non-Component (a)	DPG	-	-	-	-	-	-	-
	Dodecane	-	-	-	-	-	-	-
a-1/a		1.00	1.00	1.00	1.00	1.00	—	—
Component (b) or Non-Component (b)	b-1	1.00	-	-	-	-	1.00	1.00
	b-2	-	1.00	-	-	-	-	-
	b-3	-	-	1.00	1.00	1.00	-	-
Component (c)	c-3	-	-	-	-	-	0.500	0.500
Non-Component (c)	Propionic Acid	-	-	-	0.300	-	-	-
	Benzoicad	-	-	-	-	0.300	-	-
	LAS(C10-14 Blend)	-	-	-	-	-	-	-
	AES	-	-	-	-	-	-	-
Component (c)	Monoethanolamine	5.00	5.00	5.00	5.00	5.00	5.00	5.00
Numerical Condition	a/(b+c)	2.5	2.5	2.5	2.5	2.5	0	0
	c/(b+c)	0	0	0	0	0	0.33	0.33
pH		11.5	11.5	11.5	11.5	11.5	11.5	11.5
Cloud Point (°C)		29	25	30	30	30	>60	>60
Cleaning Performance I		95	95	95	95	95	20	30
Working Facilitation		2	2	2	2	2	2	3

(Continued)

(Continued)

Comparative Examples			8	9	10	11	12	13
Component (a)	Component (a-1)	a-1-1	-	-	3.50	2.50	2.50	2.50
	a-2		-	-	3.50	-	-	-
Non-Component (a)	DPG		2.50	-	-	-	-	-
	Dodecane		-	2.50	-	-	-	-
a-1/a			—	—	0.500	1.00	1.00	1.00
Component (b) or Non-Component (b)	b-1		1.00	1.00	-	1.00	1.00	1.00
	b-2		-	-	-	-	-	-
	b-3		-	-	1.50	-	-	-
Component (c)	c-3		0.500	0.500	0.100	-	-	0.500
Non-Component (c)	Propionic Acid		-	-	-	-	-	-
	Benzoicad		-	-	-	-	-	-
	LAS(C10-14 Blend)		-	-	-	0.500	-	-
	AES		-	-	-	-	0.500	-
Component (c)	Monoethanolamine		5.00	5.00	5.00	5.00	5.00	5.00
umerical Conditio	a/(b+c)		0	0	2.2	2.5	2.5	2.5
	c/(b+c)		0.33	0.33	0.060	0	0	0
pH			11.5	11.5	11.5	11.5	11.5	7.5
Cloud Point (°C)			>60	F	>60	>60	>60	30
Cleaning Performance I			25	F	65	90	90	90
Working Facilitation			3	F	4	2	2	4

[0071]

[Table 3]

Table 3

Comparative Examples			14	15	16	17
Component (a)	Component (a-1)	a-1-1	2.50	2.50	2.50	3.50
		a-1-2	-	-	-	-
a-1/a			1.00	1.00	1.00	1.00
Component (b) or Non-Component (b)	b-1		1.00	-	-	-
	b-2		-	1.00	-	-
	b-3		-	-	-	1.50
	b-5		-	-	1.00	-
Component (c)	c-3		0.500	0.500	0.500	0.300
Component (d)	Monoethanolamine		5.00	5.00	5.00	-
Numerical Condition	a/(b+c)		1.7	1.7	1.7	1.9
	c/(b+c)		0.33	0.33	0.33	0.17
pH			11.5	11.5	11.5	8.0
Cloud Point (°C)			>60	>60	>60	>60
Cleaning Performance I			90	90	80	80
Working Facilitation			4	4	4	4
Cleaning Performance II			75	75	75	75

[0072] From the results summarized in the tables mentioned above, the followings could be seen.

It could be seen that the products of the present invention are excellent in cleaning performances, and have a sufficiently high cloud point, and favorable working facilitation.

[0073] From Comparative Examples 6 to 9, it could be seen that when the component (a-1) was not contained, the composition had disadvantageous cleaning performances or did not form a homogeneous liquid. When the component (a-1) is contained too little in the component (a) (Comparative Example 10), a cleaning power was not sufficient. From the comparison of Example 1 with Comparative Examples 1 to 5, 11, and 12, when the content of the component (c) satisfies a given range, a cloud point would be a value exceeding 60°C, and working facilitation was high; however, when the component (c) was not contained, either a cloud point was low, or working facilitation was low. From the comparison of Example 1 with Comparative Example 13, when a pH satisfies a given range, it could be seen that a cloud point was a value exceeding 60°C, but if a pH is less than a desired range, a cloud point is lowered. Further, from Example 18 and Comparative Example 17, when a composition had a pH of 8.5 or more, it could be seen that cleaning performance against low-deterioration oil is remarkably high. Further, when the polyoxyethylene alkyl ether or alkyl (poly)glycoside was used in place of the component (b), it could be seen that cleaning performance against low-deterioration oil would be disadvantageous (Comparative Examples 14 to 16).

[0074] The component (a) and the non-(a) component in each of the tables

are as follows.

a-1-1: dipropylene glycol monobutyl ether

a-1-2: dipropylene glycol monohexyl ether

a-2: diethylene glycol monobutyl ether

DPG: dipropylene glycol

[0075] The component (b) and the non-(b) component in each of the tables are as follows.

b-1: polyoxyethylene(average number of moles of EO added=8) lauryl ether

b-2: polyoxyethylene(average number of moles of EO added=7) secondary alkyl (mixture of 12 to 14 carbon atoms) ether

b-3: lauryldimethylamine oxide

b-3': capryldimethylamine oxide

b-3": stearyldimethylamine oxide

b-4: lauroylamidopropyldimethylamine oxide

b-5: alkyl(mixture of 10 to 14 carbon atoms) glycoside (average degree of condensation of glycoside=1.3)

[0076] The component (c) and the non-component (C) in each of the tables are as follows.

c-1: caprylic acid

c-2: lauric acid

c-3: myristic acid

c-4: palmitic acid

c-5: stearic acid

c-6: sodium myristate

LAS (C10-14 mixture): sodium linear alkyl(mixture of 10 to 14 carbon atoms)benzenesulfonate

AES: sodium polyoxyethylene (the number of moles of EO added = 2) linear alkyl(mixture of 12 and 14 carbon atoms) ether sulfate

INDUSTRIAL APPLICABILITY

[**0077**] The liquid cleaning agent composition for hard surfaces of the present invention can be applied to various kinds of hard surfaces, and the composition is more suitable for hard surfaces in the kitchen area, so that the composition is suitable as a kitchen liquid cleaning agent composition.

CLAIMS

[Claim 1] A liquid cleaning agent composition for hard surfaces, comprising:

(a) a monoalkyl ether of a polyalkylene glycol represented by the following formula (a1):

$$R^{1a}(OR^{2a})_lOH \qquad (a1)$$

wherein R^{1a} is an alkyl group having 4 to 8 carbon atoms, l is the number of from 1 to 4, and R^{2a} is an alkylene group having 2 to 4 carbon atoms;

(b) an amine oxide;

(c) one or more members selected from the group consisting of fatty acids having 8 to 18 carbon atoms and salts thereof in an amount of from 0.001 to 15% by mass, provided that the mass in a case of a salt is calculated as the mass in an acid form; and

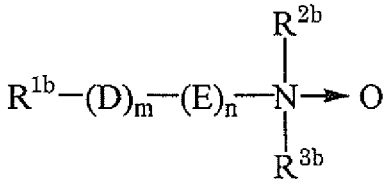
water,

wherein a mass ratio of the component (c) / (the component (b) + the component (c)) is from 0.001/1 to 1/1, and wherein 60 to 100% by mass of the component (a) is a monoalkyl ether of dipropylene glycol (a-1) of which alkyl group has 4 to 8 carbon atoms,

wherein its pH at 25°C is from 8 to 14.

[Claim 2] The composition according to claim 1, wherein a mass ratio of the component (a) / (the component (b) + the component (c)) is from 1/1 to 15/1.

[Claim 3] The composition according to claim 1 or 2, wherein the component (b) is an alkylamine or alkenylamine oxide represented by the following general formula (b1):



(b1)

wherein R^{1b} is a hydrocarbon group having 8 to 18 carbon atoms, each of R^{2b} and R^{3b}, which may be identical or different, is an alkyl group having 1 to 3 carbon atoms, D is an -NHC(=O)- group or a -C(=O)NH- group, E is an alkylene group having 1 to 5 carbon atoms, and m and n are m=0 and n=0, or m=1 and n=1.

[Claim 4] The composition according to any one of claims 1 to 3, wherein the component (b) is an alkyldimethylamine oxide, of which alkyl group has 8 to 18 carbon atoms.

[Claim 5] The composition according to any one of claims 1 to 4, wherein the composition contains, as a component (d), an alkanolamine and/or an alkali hydroxide in an amount of from 0.01 to 20% by mass.

[Claim 6] The composition according to any one of claims 1 to 5, wherein the component (a-1) is dipropylene glycol monobutyl ether.

[Claim 7] The composition according to any one of claims 1 to 6, wherein the component (b) is contained in an amount of from 0.05 to 15% by mass.

[Claim 8] The composition according to any one of claims 1 to 7, wherein the component (a) consists of a component (a-1).

[Claim 9] The composition according to any one of claims 1 to 8, wherein the component (a) is contained in an amount of from 1 to 15% by mass.

[Claim 10] The composition according to any one of claims 1 to 9, wherein a mass ratio of the component (c) / (the component (b) + the component (c))

is from 0.003/1 to 0.6/1.

[Claim 11] The composition according to any one of claims 1 to 10, wherein water is contained in an amount of from 70 to 98% by mass.

[Claim 12] The composition according to any one of claims 1 to 11, wherein the composition has a pH at 25°C of from 8.5 to 14.

[Claim 13] The composition according to any one of claims 1 to 12, wherein the composition is present in the form of a homogeneous liquid phase.

[Claim 14] The composition according to any one of claims 1 to 13, wherein the composition is applicable as a kitchen cleaning agent.

[Claim 15] A cleaning method including applying the composition as defined in any one of claims 1 to 14 to a hard surface on which grease stains are present to clean the hard surface.