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(54) **Liquid detergent containing solid peroxygen bleach**

Flüssiges Reinigungsmittel, welches festes Peroxy-Bleichmittel enthält

Composition détergente liquide contenant un agent de blanchiment peroxydant

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(73) Proprietors:

- **THE PROCTER & GAMBLE COMPANY**
Cincinnati, Ohio 45202 (US)
Designated Contracting States:
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- **Procter & Gamble European Technical Center**
(Naamloze Vennootschap)
1853 Strombeek-Bever (BE)
Designated Contracting States:
BE DE FR IT LU NL

(72) Inventors:

- **de Buzzaccarini, Francesco**
B-1050 Bruxelles (BE)

- **Boutique, Jean Pol**
B-5800 Ernage (BE)

(74) Representative: **Engisch, Gautier et al**
Procter & Gamble
European Technical Center N.V.
Temselaan 100
1853 Strombeek-Bever (BE)

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- **Methoden der Organischen Chemie, Houben**
Weyl, 1953, vol. 2, p. 572

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Description

[0001] The present invention relates to liquid detergent compositions which contain a solid, water-soluble peroxygen bleach compound. The compositions herein contain a solvent system comprising water and a water-miscible organic solvent. The solvent system is designed to keep the amount of available oxygen in solution below 0.5%, preferably below 0.1%. The amount of available oxygen in the liquid phase corresponds to not more than one fifth of the total amount of peroxygen bleach in the composition, preferably to not more than one tenth.

Background

[0002] So-called heavy duty liquid detergent compositions commercially available at present typically comprise organic surfactants, enzymes, and perfumes. These components are generally incompatible with peroxygen bleaches. As a result, no peroxygen bleach containing liquid detergent compositions are commercially available to date.

[0003] European Patent 0,037,184, granted January 23, 1985 to Interlox Chemicals Ltd. discloses liquid detergent compositions comprising organic surfactants, a builder system, at least 2% hydrogen peroxide and a stabilizing system comprising an aminoethylene phosphonate or hydroxyalkyl diphosphonate, a polyhydroxyaliphatic carboxylate, and/or a low molecular weight mono-hydroxy aliphatic alcohol.

[0004] European Patent 0,086,511, granted July 2, 1986 to The Procter & Gamble Company, discloses aqueous liquid detergent compositions having a pH below 9 and comprising organic surfactants, oxygen bleach, fatty acid and a water-soluble calcium salt.

[0005] DE-OS 3511515, published October 17, 1985, discloses non-aqueous liquid detergent compositions comprising sodiumperborate monohydrate and an activator for the perborate. FR 2,579,615, published October 3, 1986, discloses similar non-aqueous compositions which further comprise catalase inhibitors. The compositions exemplified in these two patents do not contain anionic surfactants. DE-A-1 567 583 describes certain aqueous suspensions of sodium perborate and a polymer.

[0006] It is an object of the present invention to provide aqueous liquid detergent compositions containing substantial amount of a solid, water-soluble peroxygen bleach. It is a further object of the present invention to provide such bleach containing liquid detergent compositions that contain substantial amounts of anionic surfactant.

Summary of the Invention

[0007] The liquid detergent compositions of the present invention have a pH of at least 9.5, which comprise organic surfactants and which further comprise, a solid water-soluble peroxygen compound dispersed in a liquid phase which comprises a solvent system comprising water and at least one water-miscible organic solvent, such that the amount of available oxygen (AVO) dissolved in the liquid phase is not greater than 0.5%, preferably not greater than 0.1%, by weight of the liquid phase. The amount of available oxygen dissolved in the liquid phase corresponds to not more than one fifth of the total amount of peroxygen compound in the composition, preferably to not more than one tenth.

[0008] The preferred solid, water-soluble peroxygen compounds are the perborates. The preferred water-miscible organic solvents are the low molecular weight monohydric alcohols; the most preferred of these solvents is ethanol.

[0009] Preferred are also liquid detergent compositions that further comprise detergent enzymes.

Detailed Description of the Invention

[0010] The present invention addresses the problem of formulating a liquid detergent composition that contains significant amounts of organic surfactant, including anionic surfactants, and of a solid, water-soluble peroxygen bleach, and that is stable. It has now been discovered that this may be achieved by the use of a solvent system that comprises water and a water-miscible organic solvent. This makes it possible to incorporate in the liquid detergent composition a significant amount of the peroxygen compound, while keeping the amount of available oxygen in solution below 0.5% by weight of the solvent system, preferably below 0.1%. Less than 1/5 of the total amount of the peroxygen compound in the composition is dissolved in the liquid phase, preferably less than 1/10.

[0011] The presence of water in the solvent system is essential for the solubility of, e.g. anionic surfactants. The low level of available oxygen in solution has been found to result in a bleach system that is stable upon storage under typical storage conditions.

[0012] The liquid detergent compositions are formulated at a pH of at least 9.5. The alkaline pH is conducive to a good bleaching action of the peroxygen compound, particularly when the peroxygen compound is a perborate. Nevertheless, the stability of the bleach system in an aqueous liquid of alkaline pH is surprising. At least some of the available oxygen in solution is assumed to be present in the form of hydrogen peroxide. It has been found that hydrogen peroxide is not sufficiently stable in the solvent systems of the liquid detergent compositions of the present invention.

Yet, the solid, water-soluble peroxygen bleaches have been found to be stable therein. Apparently, the low level of available oxygen in solution is critical for the stability of the system.

[0013] Examples of suitable water-soluble solid peroxygen compounds include the perborates, persulfates, peroxydisulfates, perphosphates and the crystalline peroxyhydrates formed by reacting hydrogen peroxide with sodium carbonate or urea. Preferred peroxygen bleach compounds are sodium perborate monohydrate and sodium perborate tetrahydrate.

[0014] The standard iodometric method (as described for instance in Methoden der Organischen Chemie, Houben Weyl, 1953, Vo. 2, page 572) is suitable to determine the available oxygen (AVO) content of the composition.

[0015] In order to ensure complete equilibration between liquid and solid phases, the compositions are to be kept after mixing for three days at room temperature before the AVO titration. Before measuring the products are thoroughly shaken in order to ensure correct sampling.

[0016] For the determination of the available oxygen (AVO) in the liquid phase, samples of the compositions are centrifuged for 10 minutes at 10.000 rpm. The liquid is then separated from the solid and titrated for available oxygen.

[0017] It is not necessary that the organic solvent be fully miscible with water, provided that enough of the solvent mixes with the water of the composition to affect the solubility of the peroxygen compound in the described manner. Fully water-soluble solvents are preferred for use herein.

[0018] The water-miscible organic solvent must, of course, be compatible with the peroxygen bleach compound at the pH that is used. Therefore, polyalcohols having vicinal hydroxy groups (e.g. 1,2-propanediol and glycerol) are less desirable when the peroxygen bleach compound is perborate.

[0019] Examples of suitable water-miscible organic solvents include the lower aliphatic monoalcohols; ethers of diethylene glycol and lower monoaliphatic monoalcohols; specifically ethanol, n-propanol; iso-propanol; butanol; polyethylene glycol (e.g., PEG 150, 200, 300, 400); dipropylene glycol; hexylene glycol; methoxyethanol; ethoxyethanol; butoxyethanol; ethyldiglycolether; benzylalcohol; butoxypropanol; butoxypropoxypropanol; and mixtures thereof. Preferred solvents include ethanol; iso-propanol, 1-methoxy-2-propanol and butyldiglycolether. A preferred solvent system comprises ethanol, and a co-solvent having a higher flash-point than ethanol.

[0020] Although the presence or absence of other ingredients plays a role, the amount of available oxygen in solution is largely determined by the ratio water : organic solvent. The smaller this ratio (i.e. the more organic solvent is used in the solvent system), the lower the amount of available oxygen in solution. Although this is good for stability of the bleach system, it is less desirable for a good solubility of other components (e.g. electrolyte, anionic surfactants). In any event, it is not necessary to use more organic solvent than is needed to keep the amount of available oxygen in solution below 0.5%, preferably below 0.1%.

[0021] In practical terms, the ratio water : organic solvent is, for most systems, in the range from 8 : 1 to 1 : 3, preferably from 5 : 1 to 1 : 2.

[0022] The liquid detergent compositions herein contain from 5% to 60% of the liquid detergent composition, preferably from 15% to 40% of an organic surface-active agent selected from nonionic, anionic, and zwitterionic surface-active agents and mixtures thereof.

[0023] Synthetic anionic surfactants can be represented by the general formula R^1SO^3M wherein R^1 represents a hydrocarbon group selected from the group consisting of straight or branched alkyl radicals containing from about 8 to about 24 carbon atoms and alkyl phenyl radicals containing from about 9 to about 15 carbon atoms in the alkyl group. M is a salt forming cation which typically is selected from the group consisting of sodium, potassium, ammonium, and mixtures thereof.

[0024] A preferred synthetic anionic surfactant is a water-soluble salt of an alkylbenzene sulfonic acid containing from 9 to 15 carbon atoms in the alkyl group. Another preferred synthetic anionic surfactant is a water-soluble salt of an alkyl sulfate or an alkyl polyethoxylate ether sulfate wherein the alkyl group contains from about 8 to about 24, preferably from about 10 to about 18 carbon atoms and there are from about 1 to about 20, preferably from about 1 to about 12 ethoxy groups. Other suitable anionic surfactants are disclosed in U.S. Patent 4,170,565, Flesher et al., issued October 9, 1979.

[0025] The nonionic surfactants are conventionally produced by condensing ethylene oxide with a hydrocarbon having a reactive hydrogen atom, e.g., a hydroxyl, carboxyl, or amido group, in the presence of an acidic or basic catalyst, and include compounds having the general formula $RA(CH_2CH_2O)_nH$ wherein R represents the hydrophobic moiety, A represents the group carrying the reactive hydrogen atom and n represents the average number of ethylene oxide moieties. R typically contains from about 8 to 22 carbon atoms. They can also be formed by the condensation of propylene oxide with a lower molecular weight compound. n usually varies from about 2 to about 24.

[0026] The hydrophobic moiety of the nonionic compound is preferably a primary or secondary, straight or branched, aliphatic alcohol having from about 8 to about 24, preferably from about 12 to about 20 carbon atoms. A more complete disclosure of suitable nonionic surfactants can be found in U.S. Patent 4,111,855. Mixtures of nonionic surfactants can be desirable.

[0027] Zwitterionic surfactants include derivatives of aliphatic quaternary ammonium, phosphonium, and sulphonium

compounds in which the aliphatic moiety can be straight or branched chain and wherein one of the aliphatic substituents contains from about 8 to about 24 carbon atoms and another substituent contains, at least, an anionic water-solubilizing group. Particularly preferred zwitterionic materials are the ethoxylated ammonium sulfonates and sulfates disclosed in U.S. Patents 3,925,262, Laughlin et al., issued December 9, 1975 and 3,929,678, Laughlin et al., issued December 30, 1975.

[0028] Semi-polar nonionic surfactants include water-soluble amine oxides containing one alkyl or hydroxy alkyl moiety of from about 8 to about 28 carbon atoms and two moieties selected from the group consisting of alkyl groups and hydroxy alkyl groups, containing from 1 to about 3 carbon atoms which can optionally be joined into ring structures.

[0029] Suitable anionic synthetic surface-active salts are selected from the group of sulfonates and sulfates. The like anionic detergents are well-known in the detergent arts and have found wide-spread application in commercial detergents. Preferred anionic synthetic water-soluble sulfonate or sulfate salts have in their molecular structure an alkyl radical containing from about 8 to about 22 carbon atoms.

[0030] Examples of such preferred anionic surfactant salts are the reaction products obtained by sulfating C₈-C₁₈ fatty alcohols derived from tallow and coconut oil ; alkylbenzene sulfonates wherein the alkyl group contains from about 9 to 15 carbon atoms ; sodium alkylglyceryl ether sulfonates ; ether sulfates of fatty alcohols derived from tallow and coconut oils ; coconut fatty acid monoglyceride sulfates and sulfonates ; and water-soluble salts of paraffin sulfonates having from about 8 to about 22 carbon atoms in the alkyl chain. Sulfonated olefin surfactants as more fully described in e.g. U.S. Patent Specification 3,332,880 can also be used. The neutralizing cation for the anionic synthetic sulfonates and/or sulfates is represented by conventional cations which are widely used in detergent technology such as sodium and potassium.

[0031] A particularly preferred anionic synthetic surfactant component herein is represented by the water-soluble salts of an alkylbenzene sulfonic acid, preferably sodium alkylbenzene sulfonates having from about 10 to 13 carbon atoms in the alkyl group.

[0032] A preferred class of nonionic ethoxylates is represented by the condensation product of a fatty alcohol having from 12 to 15 carbon atoms and from about 4 to 10 moles of ethylene oxide per mole of fatty alcohol. Suitable species of this class of ethoxylates include : the condensation product of C₁₂-C₁₅ oxo-alcohols and 7 moles of ethylene oxide per mole of alcohol ; the condensation product of narrow cut C₁₄-C₁₅ oxo-alcohols and 7 or 9 moles of ethylene oxide per mole of fatty(oxo)alcohol ; the condensation product of a narrow cut C₁₂-C₁₃ fatty(oxo) alcohol and 6,5 moles of ethylene oxide per mole of fatty alcohol ; and the condensation products of a C₁₀-C₁₄ coconut fatty alcohol with a degree of ethoxylation (moles EO/mole fatty alcohol) in the range from 5 to 8. The fatty oxo alcohols while mainly linear can have, depending upon the processing conditions and raw material olefins, a certain degree of branching, particularly short chain such as methyl branching.

[0033] A degree of branching in the range from 15% to 50% (weight %) is frequently found in commercial oxo alcohols.

[0034] Preferred nonionic ethoxylated components can also be represented by a mixture of 2 separately ethoxylated nonionic surfactants having a different degree of ethoxylation. For example, the nonionic ethoxylate surfactant containing from 3 to 7 moles of ethylene oxide per mole of hydrophobic moiety and a second ethoxylated species having from 8 to 14 moles of ethylene oxide per mole of hydrophobic moiety. A preferred nonionic ethoxylated mixture contains a lower ethoxylate which is the condensation product of a C₁₂-C₁₅ oxo-alcohol, with up to 50% (wt) branching, and from about 3 to 7 moles of ethylene oxide per mole of fatty oxo-alcohol, and a higher ethoxylate which is the condensation product of a C₁₆-C₁₉ oxo-alcohol with more than 50% (wt) branching and from about 8 to 14 moles of ethylene oxide per mole of branched oxo-alcohol.

[0035] The liquid detergent compositions herein optionally contain a cationic surfactant, preferably from 0.1% to 4% by weight of the composition.

[0036] Example of suitable cationic surfactants include quaternary ammonium compounds of the formula R₁ R₂ R₃ R₄ N⁺X⁻, wherein R₁ is C₁₂-C₂₀ alkyl or hydroxyalkyl; R₂ is C₁-C₄ alkyl or C₁₂-C₂₀ alkyl or hydroxyalkyl or C₁-C₄ hydroxyalkyl ; R₃ and R₄ are each C₁-C₄ alkyl or hydroxyalkyl, or C₆-C₈ aryl or alkylaryl ; and X⁻ is halogen. Preferred are mono-long chain quaternary ammonium compounds (i.e., compounds of the above formula wherein R₂ is C₁-C₄ alkyl or hydroxyalkyl).

[0037] The liquid detergent compositions herein optionally contain, as a builder, a fatty acid component. Preferably, however, the amount of fatty acid is less than 5% by weight of the composition, more preferably less than 4%. Preferred saturated fatty acids have from 10 to 16, more preferably 12 or 14 carbon atoms. Preferred unsaturated fatty acids are oleic acid and palmitoleic acid.

[0038] Detergent enzymes can be used in the liquid detergent compositions of this invention. In fact, one of the desirable features of the present compositions is that they are compatible with such detergent enzymes. Suitable enzymes include the detergent proteases, amylases, lipases and cellulases. Enzymatic stabilizing agents for use in aqueous liquid detergents are well known. Preferred herein is a salt of formic acid, e.g., sodium formate. The amount of this stabilizing agent typically ranges from 0.5% to 2%.

[0039] Preferred compositions contain an inorganic or organic builder. Examples of inorganic builders include the

phosphorous-based builders, e.g., sodium tripolyphosphate, sodium pyrophosphate, and aluminosilicates (zeolites).

[0040] Examples of organic builders are represented by polyacids such as citric acid, nitrilotriacetic acid, and mixtures of tartrate monosuccinate with tartrate disuccinate. Preferred builders for use herein are citric acid and alk(en)yl-substituted succinic acid compounds, wherein alk(en)yl contains from 10 to 16 carbon atoms. An example of this group of compounds is dodecenyl succinic acid. Polymeric carboxylate builders inclusive of polyacrylates, polyhydroxy acrylates and polyacrylates/polymaleates copolymers can also be used.

[0041] The compositions herein can contain a series of further optional ingredients which are mostly used in additive levels, usually below about 5%. Examples of the like additives include : polyacids, enzymes and enzymatic stabilizing agents, suds regulants, opacifiers, agents to improve the machine compatibility in relation to enamel-coated surfaces, bactericides, dyes, perfumes, brighteners and the like.

[0042] The liquid compositions herein can contain further additives of a level from 0.05 to 2%.

[0043] These additives include polyaminocarboxylates such as ethylenediaminetetracetic acid, diethylenetriaminopentacetic acid, ethylenediamino disuccinic acid or the water-soluble alkali metals thereof. Other additives include organo-phosphonic acids ; particularly preferred are ethylenediamino tetramethylenephosphonic acid, hexamethylenediamino tetramethylenephosphonic acid, diethylenetriamino pentamethylenephosphonic acid and aminotrimethylenephosphonic acid.

[0044] Bleach stabilizers such as ascorbic acid, dipicolinic acid, sodium stannates and 8-hydroxyquinoline can also be included in these compositions, at levels between 0.01 and 1%.

[0045] The beneficial utilization of the claimed compositions under various usage conditions can require the utilization of a suds regulant. While generally all detergent suds regulants can be utilized preferred for use herein are alkylated polysiloxanes such as dimethylpolysiloxane also frequently termed silicones. The silicones are frequently used in a level not exceeding 1.5%, most preferably between 0.1% and 1.0%.

[0046] It can also be desirable to utilize opacifiers in as much as they contribute to create a uniform appearance of the concentrated liquid detergent compositions. Examples of suitable opacifiers include : polystyrene commercially known as LYTRON 621 manufactured by MONSANTO CHEMICAL CORPORATION. The opacifiers are frequently used in an amount from 0.3% to 1.5%.

[0047] The liquid detergent compositions of this invention further can comprise an agent to improve the washing machine compatibility, particularly in relation to enamel-coated surfaces.

[0048] It can further be desirable to add from 0.1% to 5% of known antiredeposition and/or compatibilizing agents. Examples of the like additives include : sodium carboxymethylcellulose ; hydroxy-C₁₋₆-alkylcellulose ; polycarboxylic homo- or copolymeric ingredients, such as : polymaleic acid ; a copolymer of maleic anhydride and methylvinylether in a molar ratio of 2 : 1 to 1 : 2 ; and a copolymer of an ethylenically unsaturated monocarboxylic acid monomer, having not more than 5, preferably 3 or 4 carbon atoms, for example(meth)acrylic acid, and an ethylenically unsaturated dicarboxylic acid monomer having not more than 6, preferably 4 carbon atoms, whereby the molar ratio of the monomers is in the range from 1 : 4 to 4 : 1, said copolymer being described in more detail in EUROPEAN Patent Application 0066915, filed May 17, 1982.

[0049] The physical stability of the liquid detergent compositions is enhanced by the addition of small amounts of C₁₈-C₂₂ saturated fatty acid soaps or derivatives of such fatty acids, like esters or amides. Preferred are alkali metal soaps of C₁₈-C₂₂ fatty acids, typically from 0.1% to 2%. A suitable example is sodium stearate.

[0050] The following examples illustrate the invention and facilitates its understanding.

[0051] Liquid detergent compositions are prepared by mixing the listed ingredients in the stated proportions :

	<u>Ingredients</u>	<u>Composition (weight %)</u>	
		<u>II</u>	<u>IV</u>
5	Water	32	23
	Ethanol	15	22
10	Linear dodecylbenzene sulfonic acid	10	8
	Condensation product of 1 mole of C13-C15 oxo alcohol and 7 moles of ethylene oxide	9	8
15	Sodium cocoyl sulfate	3	2
	Dodeceny l succinic acid	10	15
20	Citric acid	1	0.8
	Oleic acid	4	2
	Protease	0.5	0.5
25	Diethylenetriamine pentamethylene phosphonic acid	0.85	0.05
	Sodium formate	1	1
30	Sodium perborate monohydrate	10	10
	Sodium hydroxide (to adjust to) pH	10	11
35	Perfume, minors	b a l a n c e	

*) sodium perborate tetrahydrate*

	<u>Ingredients</u>	<u>Composition (weight %)</u>					
		<u>VII</u>	<u>VIII</u>	<u>IX</u>	<u>X</u>	<u>XI</u>	<u>XII</u>
5	Water	28	27	32	23	28	22
	Ethanol	-	7	5	6	7	8
10	1-Methoxy-2-propanol	14	3.5	-	-	7	7
	Isopropanol	-	-	-	6	-	-
	Butyldiglycoether	-	4.0	5	-	-	-
	Linear dodecylbenzene sulfonic acid	12	7	13	12	10	9
15	Monionic surfactant	7	11	3.5	6	8	7
	Sodium cocoylsulfate	2.5	2.5	3.0	4.0	3.0	2.0
	TMS/TDS *	-	-	-	-	6.5	3.5
20	Dodecyl succinic acid	9	-	-	7	8.5	9.5
	Tetradecylsuccinic acid	4	-	-	-	-	1.0
	Coconut fatty acid	-	16	1.0	1.0	-	-
25	Oleic acid	3.6	4.0	2.0	3.0	2.0	2.5
	Citric acid	0.9	0.5	-	3.5	-	0.5
	DTPMPA **	0.5	0.5	-	0.4	0.8	1.5
30	Ethylene diamine tetraacetic acid	-	-	1.0	0.4	-	-
	Sodium tripolyphosphate	-	-	15.0	-	-	-
	Sodium perborate tetrahydrate	-	-	-	17	-	-
	Sodium perborate monohydrate	10.4	9	13	-	13	19
35	Sodium formate	0.8	1.0	1.0	1.5	0.5	1.0
	Protease	0.6	0.8	0.5	1.0	0.5	0.6
	Sodium hydroxide to pH	10	11	11	9.5	10.5	10.5
40	Perfume, minors	-	-	-	balance	-	-

* 80:20 mixture of tartrate monosuccinate and tartrate

disuccinate

** Diethylenetriamino pentamethylene phosphonic acid

	<u>Ingredients</u>	<u>Composition (weight %)</u>					
		<u>XIII</u>	<u>XIV</u>	<u>XV</u>	<u>XVI</u>	<u>XVII</u>	<u>XVIII</u>
5	water	27	27	27	24	23.5	25
	ethanol	13	8	10	13	13	10
	co-solvent 1)	-	5	3	-	-	3
10	linear dodecylbenzene sulfonic acid	9	9	9	9	9	9
	condensation product of 1 mole of						
15	C ₁₃ -C ₁₅ oxo alcohol and 7 moles of ethylene oxide	7	7	7	7	7	7
	sodium cocoyl sulfate	1	1	1	1	1	1
20	dodecenyl succinic acid	13	13	13	13	13	13
	citric acid	0.8	0.8	0.8	0.8	0.8	0.8
	oleic acid	3	3	3	3	3	3
25	protease	0.8	0.5	0.5	0.5	0.5	0.5
	diethylene triamine						
	pentamethylene phosphonic acid	0.7	0.7	0.7	0.7	0.7	0.7
	sodium stearate	-	-	0.3	1.0	1.5	0.6
30	sodium formate	1.0	1.0	1.0	1.0	1.0	1.0
	sodium perborate monohydrate	14.0	14.0	14.0	14.0	14.0	14.0
	C ₁₂ -C ₁₄ trimethyl ammonium chloride	-	-	-	2.0	-	-
35	C ₁₂ -C ₁₄ (2-hydroxyethyl) dimethyl ammonium chloride	-	-	-	-	2.0	-
	C ₁₈ (2-hydroxyethyl) dimethyl ammonium chloride	-	-	-	-	-	2.0
40	Sodium hydroxide (to adjust to) pH	10	10	10	10	10	10
	Perfume, minors	— balance —					

1) selected from

= PEG 150, 200, 300, 400//dipropyleneglycol, hexyleneglycol, n-propanol, iso-propanol, Methoxyethanol, Ethoxyethanol, Butoxyethanol, Ethyldiglycol, Butyldiglycolether, Benzylalcohol, Butoxypropanol, ButoxyPropoxypropanol.

Claims

1. A liquid, bleach containing detergent composition comprising anionic surfactants and having a pH of a least 9.5, said composition comprising a solid, water-soluble peroxygen compound, suspended in a liquid phase which comprises a solvent system comprising water and at least one water-miscible organic solvent, characterized in that

an amount of available oxygen is dissolved in the liquid phase which is not greater than 0.5% by weight of the liquid phase and corresponds to not more than one fifth of the total amount of peroxygen compound in the composition.

- 5 2. A liquid detergent composition according to claim 1, wherein the amount of available oxygen in the liquid phase is not greater than 0.1% by weight of the liquid phase.
3. A liquid detergent composition according to claim 1 or 2 wherein the amount of available oxygen dissolved in the liquid phase corresponds to not more than one tenth of the total amount of peroxygen compound in the composition.
- 10 4. A liquid detergent composition according to claims 1, 2 or 3, wherein the water-miscible organic solvent is an aliphatic monoalcohol.
5. A liquid detergent composition according to claim 4, wherein the water-miscible organic solvent is ethanol.
- 15 6. A liquid detergent composition according to claim 5, wherein the solvent comprises water and ethanol in a water : ethanol ratio of from 8 : 1 to 1 : 3.
7. A liquid detergent composition according to claim 6, wherein the water : ethanol ratio is from 5 : 1 to 1 : 2.
- 20 8. A liquid detergent composition according to any one of the preceding claims, wherein the solid, water-soluble peroxygen compound is a perborate.
9. A liquid detergent composition according to any one of the preceding claims, wherein the solid, water-soluble peroxygen compound is sodium percarbonate.
- 25 10. A liquid detergent composition according to any one of the preceding claims containing less than 4% fatty acid.
11. A liquid detergent composition according to any one of the preceding claims comprising, from 5% to 40% of a builder selected from dodecenyl succinic acid ; tetradecenyl succinic acid ; dodecyl succinic acid ; an 80 : 20 mixture of tartrate monosuccinate and tartrate discuccinate ; citric acid ; and mixtures thereof.
- 30

Patentansprüche

- 35 1. Flüssige, Bleichmittel enthaltende Detergenezusammensetzung, welche anionische grenzflächenaktive Mittel umfaßt und einen pH-Wert von mindestens 9,5 besitzt, welche Zusammensetzung eine feste, wasserlösliche Persauerstoffverbindung enthält, die in einer flüssigen Phase suspendiert ist, welche ein Lösungsmittelsystem enthält, das Wasser und mindestens ein wassermischbares organisches Lösungsmittel umfaßt, welche dadurch gekennzeichnet ist, daß eine Menge von verfügbarem Sauerstoff in der flüssigen Phase gelöst ist, welche nicht mehr als 0,5 Gew.-% der flüssigen Phase beträgt und nicht mehr als einem Fünftel der Gesamtmenge an Persauerstoffverbindung in der Zusammensetzung entspricht.
- 40 2. Flüssige Detergenezusammensetzung nach Anspruch 1, worin die Menge an verfügbarem Sauerstoff in der flüssigen Phase nicht mehr als 0,1 Gew.-% der flüssigen Phase beträgt.
- 45 3. Flüssige Detergenezusammensetzung nach Anspruch 1 oder 2, worin die Menge an in der flüssigen Phase gelöstem, verfügbarem Sauerstoff nicht mehr als einem Zehntel der Gesamtmenge an Persauerstoffverbindung in der Zusammensetzung entspricht.
- 50 4. Flüssige Detergenezusammensetzung nach den Ansprüchen 1, 2 oder 3, worin das wassermischbare organische Lösungsmittel ein aliphatischer Monoalkohol ist.
- 55 5. Flüssige Detergenezusammensetzung nach Anspruch 4, worin das wassermischbare organische Lösungsmittel Ethanol ist.
6. Flüssige Detergenezusammensetzung nach Anspruch 5, worin das Lösungsmittel Wasser und Ethanol in einem Verhältnis von Wasser zu Ethanol von 8:1 bis 1:3 enthält.

7. Flüssige Detergenezusammensetzung nach Anspruch 6, worin das Verhältnis von Wasser zu Ethanol von 5:1 bis 1:2 beträgt.
- 5 8. Flüssige Detergenezusammensetzung nach einem der vorstehenden Ansprüche, worin die feste, wasserlösliche Persauerstoffverbindung ein Perborat ist.
9. Flüssige Detergenezusammensetzung nach einem der vorstehenden Ansprüche, worin die feste, wasserlösliche Persauerstoffverbindung Natriumpercarbonat ist.
- 10 10. Flüssige Detergenezusammensetzung nach einem der vorstehenden Ansprüche, welche weniger als 4 % Fettsäure enthält.
11. Flüssige Detergenezusammensetzung nach einem der vorstehenden Ansprüche, umfassend von 5% bis 40% eines Gerüststoffes, welcher unter Dodecenylnbernsteinsäure, Tetradecenylbernsteinsäure, Dodecylbernsteinsäure, einem Gemisch aus Tartratmonosuccinat und Tartratdisuccinat im Verhältnis von 80:20, Zitronensäure und Gemischen hievon ausgewählt ist.
- 15

Revendications

- 20 1. Une composition détergente liquide contenant un agent de blanchiment comprenant des agents de surface anioniques et ayant un pH d'au moins 9,5, ladite composition contenant un composé peroxygéné solide soluble dans l'eau, en suspension dans une phase liquide contenant un système de solvants comprenant de l'eau et au moins un solvant organique miscible à l'eau, caractérisée en ce qu'une quantité d'oxygène disponible est dissoute dans la phase liquide qui n'est pas supérieure à 0,5% en poids de la phase liquide et correspond à pas plus de un cinquième de la quantité totale de composé peroxygéné dans la composition.
- 25 2. Une composition détergente liquide selon la revendication 1, dans laquelle la quantité d'oxygène disponible dans la phase liquide est non supérieure à 0,1% en poids de la phase liquide.
- 30 3. Une composition détergente liquide selon la revendication 1 ou 2, dans laquelle la quantité d'oxygène disponible dissous dans la phase liquide correspond à pas plus de un dixième de la quantité totale de composé peroxygéné dans la composition.
- 35 4. Une composition détergente liquide selon les revendications 1, 2 ou 3, dans laquelle le solvant organique miscible à l'eau est un monoalcool aliphatique.
- 40 5. Une composition détergente liquide selon la revendication 4, dans laquelle le solvant organique miscible à l'eau est l'éthanol.
6. Une composition détergente liquide selon la revendication 5, dans laquelle le solvant comprend de l'eau et de l'éthanol dans un rapport eau:éthanol de 8:1 à 1:3.
- 45 7. Une composition détergente liquide selon la revendication 6, dans laquelle le rapport eau:éthanol est de 5:1 à 1:2.
8. Une composition détergente liquide selon l'une quelconque des revendications précédentes, dans laquelle le composé peroxygéné solide soluble dans l'eau est un perborate.
- 50 9. Une composition détergente liquide selon l'une quelconque des revendications précédentes, dans laquelle le composé peroxygéné solide soluble dans l'eau est le percarbonate de sodium.
10. Une composition détergente liquide selon l'une quelconque des revendications précédentes, contenant moins de 4% d'acides gras.
- 55 11. Une composition détergente liquide selon l'une quelconque des revendications précédentes contenant 5% à 40% d'un adjuvant de détergence choisi parmi l'acide dodécénylsuccinique; l'acide tétradécénylsuccinique; l'acide dodécylsuccinique; un mélange de 80:20 de monosuccinate-tartrate et de disuccinate-tartrate; l'acide citrique et leurs mélanges.