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(54) **Bleaching compositions**

(57) The present invention relates to hypohalite bleaching compositions wherein an anionic surfactant is used to improve whiteness on fabrics.

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Description

Field of the invention

5 The present invention relates to bleaching compositions, in particular to hypochlorite bleaching compositions, suitable for use in laundry applications such as hand and machine laundry methods.

Background of the invention

10 Bleaching compositions are well-known in the art. Amongst the different bleaching compositions available, those relying on bleaching by hypohalite bleaches such as hypochlorite are often preferred, mainly for performance reasons, especially at lower temperature.

However, a problem encountered with the use of hypochlorite based-compositions is the resulting yellowing of the fabrics being bleached.

15 It is therefore an object of the invention to provide a hypohalite-containing composition, suitable for use in laundry applications, which provides improved fabric whiteness to fabrics treated therewith.

To fulfill such needs, pH buffering components such as silicates have been incorporated in hypochlorite compositions. A typical disclosure can be found in EP-A-0,653,483.

20 The Applicant has thus now surprisingly found that the provision of an anionic surfactant in a hypohalite bleaching composition containing a pH buffering component provides improved fabric whiteness compared to the same without the anionic surfactant.

Another advantage of the compositions of the invention is that they are chemically stable. By "chemically stable", it is meant that the hypohalite bleaching compositions of the present invention should not undergo more than 15% loss of available chlorine after 5 days of storage at $50^{\circ}\text{C} \pm 0.5^{\circ}\text{C}$. The % loss of available chlorine may be measured using the method described, for instance, in "Analyses des Eaux et Extraits de Javel" by "La chambre syndicale nationale de L'eau de Javel et des produits connexes", pages 9-10 (1984). Said method consists in measuring the available chlorine in the fresh compositions, i.e. just after they are made, and in the same compositions after 5 days at 50°C .

25 A further advantage of the compositions of the invention is that they are suitable for the bleaching of different types of fabrics including natural fabrics (e.g., fabrics made of cotton, viscose, linen, silk and wool), synthetic fabrics such as those made of polymeric fibers of synthetic origin as well as those made of both natural and synthetic fibers. Indeed, the compositions of the present invention may be used on synthetic fibers despite a standing prejudice against the use of hypohalite bleaches, especially hypochlorite bleaches, on synthetic fibers, as evidenced by warning on labels of commercially available hypochlorite bleaches and clothes.

35 Summary of the invention

The present invention is a liquid or solid bleaching composition comprising:

- a hypohalite bleach,
- 40 - a pH buffering component in an amount of 0.5% to 9% by weight, and
- an effective amount of an anionic surfactant

The present invention also encompasses the use of an anionic surfactant, in a hypohalite bleaching composition, for providing improved fabric whiteness to the fabrics treated therewith.

45 The present invention also encompasses a process of bleaching fabrics with a composition comprising:

- a hypohalite bleach
- a pH buffering component in an amount of 0.5% to 9% by weight, and
- an effective amount of an anionic surfactant,

50 where said fabrics are immersed in a bleaching solution formed by diluting said composition in water.

Detailed description of the invention

55 Hypohalite bleach

An essential component of the invention is a hypohalite bleach. Hypohalite bleaches may be provided by a variety of sources, including bleaches that are oxidative bleaches and subsequently lead to the formation of positive halide ions

as well as bleaches that are organic based sources of halides such as chloroisocyanurates.

Suitable hypohalite bleaches for use herein include the alkali metal and alkaline earth metal hypochlorites, hypobromites, hypoiodites, chlorinated trisodium phosphate dodecahydrates, potassium and sodium dichloroisocyanurates, potassium and sodium trichlorocyanurates, N-chloroimides, N-chloroamides, N-chloroamines and chlorohydantoins.

5 For liquid compositions, the preferred hypohalite bleaches among the above described are the alkali metal and/or alkaline earth metal hypochlorites selected from the group consisting of sodium, potassium, magnesium, lithium and calcium hypochlorites, and mixtures thereof, more preferably the alkali metal sodium hypochlorite.

10 For solid compositions, the preferred hypohalite bleaches among the above described are the alkali metal and/or alkaline earth metal hypochlorites selected from the group consisting of lithium hypochlorites, calcium hypochlorites, chlorinated trisodium phosphate dodecahydrates, potassium dichloroisocyanurates, sodium dichloroisocyanurates, potassium trichlorocyanurates, sodium trichlorocyanurates, and mixtures thereof, more preferably sodium dichloroisocyanurates and/or calcium hypochlorite.

15 Preferably, the liquid compositions according to the present invention comprise said hypohalite bleach such that the content of active halide in the composition is of from 0.1% to 20% by weight, more preferably from 2% to 8% by weight, most preferably from 3% to 6% by weight of the composition.

Preferably, the solid compositions according to the present invention comprise said hypohalite bleach such that the content of active halide in the composition is of from 20% to 95% by weight, more preferably from 25% to 60% by weight of the composition.

20 pH buffering component

A pH buffering component is another essential component for the compositions of the invention. The pH buffering component ensures that the pH of the composition is buffered to a pH value ranging from 7.5 to 13, preferably from 8 to 12, more preferably from 8.5 to 11.5 after the composition has been diluted into 1 to 500 times its weight of water.

25 Suitable pH buffering components for use herein are selected from the group consisting of alkali metal salts of carbonates, polycarbonates, sesquicarbonates, silicates, polysilicates, borates, metaborates, phosphates, stannates, alluminates and mixtures thereof, and preferably are selected from the group consisting of sodium carbonate, sodium silicate, sodium borate, and mixtures thereof.

30 The raw materials involved in the preparation of hypohalite bleaches usually contain by-products, e.g calcium carbonate resulting in an amount of up to 0.4% by weight of by-product within the hypohalite composition. However, at such amount, the by-product will not have the buffering action defined above.

Liquid bleaching compositions herein will contain an amount of pH buffering component of from 0.5% to 9% by weight, preferably from 0.5% to 5% by weight, and more preferably in an amount of from 0.6% to 3% by weight of the composition.

35 Solid bleaching compositions herein will preferably contain an amount of pH buffering component of from 3% to 30% by weight, more preferably from 5% to 25% by weight, and most preferably in an amount of from 10% to 20% by weight of the composition.

Anionic surfactant

40 Another essential component of the invention is an anionic surfactant. Anionic surfactants have been extensively described in the art, and suitable anionic surfactants for use herein are alkylbenzenesulphonates, alkylsulphates, alkylethoxysulphates or alkylethoxycarboxylates with an alkyl chain from 4 to 24 carbon atoms, preferably 8 to 18, most preferably 8 to 16. The counterion for the anionic functionality is typically chosen from alkali metals, most preferred is sodium.

In the context of the present invention, the anionic surfactant is typically used at levels of from 0.1% to 10% by weight of the total composition, preferably 0.1% to 5%, most preferably 0.3% to 3%.

An effective amount of anionic surfactant will improve the whiteness to fabrics which are treated with the bleaching composition comprising the anionic surfactant.

50 The whitening effect, i.e. the yellowing-prevention effect of the present invention can be evaluated by comparing the composition according to the present invention to the same composition without anionic surfactant, by either visual or instrumental grading. Visually, the difference in yellowing between items treated with different compositions can be determined by a team of expert panelists. Instrumentally, the assessment can be determined with the help of Colorimeters such as Ganz Griesser[®] instruments (e.g., Datacolor[®] Spectraflash[®] SF 500, Machbet White-eye[®] 500) or a ZEISS ELREPHO[®] or others which are available for instance from Hunterlab[®] or Gardner[®].

55 Of course, mixtures of different anionic surfactants are suitable for use herein. In particular, some anionic surfactants for use herein may be poorly soluble in the hypochlorite matrixes herein, when they are liquid. Such surfactants, typically alkylbenzenesulphonates, may thus require the use of a co-surfactant and/or a hydrotrope.

Such suitable co-surfactants include alkyl sulphates or alkylethoxysulphates having from 4 to 12 carbon atoms in the alkyl chain, or alkylethoxycarboxylates having from 6 to 24 carbon atoms in the alkyl chain, such as Akyposoft® 100NV from Chemy or Sandosan LNCS from Sandoz. Preferred are C8 alkyl sulphate and C12-14 alkylethoxycarboxylates with 10 ethoxylations in the molecule. Suitable hydrotropes are, for example, sodium cumenesulphonate and xylenesulphonate.

Such co-surfactants and/or hydrotropes herein should be used in amounts required to solubilize the anionic surfactant in need thereof.

Generally, when a co-surfactant is used, the liquid compositions of the present inventions are prepared in a process wherein the anionic surfactant and the co-surfactant and/or hydrotrope are first-mixed to form a premix, before the premix is then mixed with the remainder of the composition which has been separately prepared.

The compositions according to the present invention are either in liquid or solid form. Solid forms include forms such as powders, tablets and granules. Preferably, the compositions of the invention are in liquid aqueous form. More preferably, they comprise water in an amount of from 60% to 98% by weight, more preferably of from 80% to 97% and most preferably of from 85% to 97% by weight of the total aqueous liquid bleaching composition.

pH

The pH of the liquid compositions according to the present invention, as is, is typically from 12 to 14 measured at 25°C. Solid compositions or liquid compositions of the invention have a pH of from 7.5 to 13, preferably from 8 to 12, more preferably from 8.5 to 11.5, when diluted into 1 to 500 times its weight of water. It is in this alkaline range that the optimum stability and performance of the hypochlorite as well as fabric whiteness and/or safety are obtained. The pH range is suitably provided by the pH buffering component and the hypochlorite bleach mentioned hereinbefore, which are alkalis. However, in addition to these components, a strong source of alkalinity may also optionally be used.

Suitable sources of alkalinity are the caustic alkalis such as sodium hydroxide, potassium hydroxide and/or lithium hydroxide, and/or the alkali metal oxides such as sodium and/or potassium oxide. A preferred strong source of alkalinity is a caustic alkali, more preferably sodium hydroxide and/or potassium hydroxide. Typical levels of such caustic alkalis, when present, are of from 0.1% to 1.5% by weight, preferably from 0.5% to 1.5% by weight of the composition.

The composition according to the invention may also comprise further optional components such as perfumes, bleach-stable surfactants, organic or inorganic alkalis, pigments, dyes, optical brighteners, solvents, chelating agents, radical scavengers and mixtures thereof.

Preferably, the compositions of the invention are used in diluted form in laundry applications. The expression "used in diluted form" herein includes dilution by the user, which occurs for instance in hand laundry applications, as well as dilution by other means, such as in a washing machine. Preferably, the composition is diluted into 5 to 500 times its weight of water for hand laundry application and 10 to 500 times its weight of water in a washing machine. Thus, in another aspect of the invention, there is provided a process for bleaching fabrics with a composition as disclosed herein, where said fabrics are immersed in a bleaching solution formed by diluting said composition in water.

In another aspect of the invention, there is provided the use of LAS in a hypochlorite bleaching composition for providing improved whiteness to the fabrics treated therewith. In this embodiment, the compositions preferably, but not compulsorily, comprise a pH buffering component.

The invention is illustrated in the following non-limiting example, in which all percentages are on a weight basis unless otherwise stated.

Example 1

The following compositions, according to the invention, were prepared :

Composition weight %)	1	2	3	4	5	6	7	8
Sodium hypochlorite	5.0	5.0	5.0	2.5	2.5	2.5	5.0	5.0
Sodium hydroxide	0.9	0.7	0.7	0.9	0.7	0.7	0.5	-
Sodium carbonate	1.2	1.2	1.2	1.2	1.2	1.2	-	1.5
Sodium silicate	-	0.5	-	-	0.5	-	-	-
Sodium metaborate	-	-	1.0	-	-	1.0	1.0	-
C8 alkylsulphate	1	1	1	-	-	0.5	-	-

(continued)

Composition weight %	1	2	3	4	5	6	7	8
Akyposoft 100NV	-	-	-	1	0.5	-	0.5	1.5
Sodium C12-C14 LAS	1	1	1	1	0.5	0.5	0.5	1.5
Water and minors	balance to 100%							

Claims

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1. A liquid or solid bleaching composition comprising:

- a hypochlorite bleach
- a pH buffering component in an amount of 0.5% to 9% by weight, and
- an effective amount of an anionic surfactant

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2. The use of an anionic surfactant in a hypochlorite bleaching, for providing improved whiteness to the fabrics treated therewith.

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3. The composition according to claim 1 or use according to claim 2 wherein said anionic surfactant is selected from the group consisting of alkylbenzenesulphonates, alkylsulphates, alkylethoxysulphates or alkylethoxycarboxylates with an alkyl chain from 4 to 24 carbon atoms, preferably 8 to 18, most preferably 8 to 16.

4. The use according to claim 2 or 3, wherein said composition comprises a pH buffering component.

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5. A bleaching composition according to claim 1 or 3, or use according to claim 4, wherein said pH buffering component is selected from the group consisting of alkali metal salts of carbonates, polycarbonates, sesquicarbonates, silicates, polysilicates, borates, metaborates, phosphates, stannates, alluminates, and mixtures thereof.

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6. A bleaching composition or use according to claim 5, wherein said pH buffering component is selected from the group consisting of sodium carbonate, sodium silicates, sodium borate, and mixtures thereof.

7. A bleaching composition according to claims 1, 3, 5 or 6, or use according to claims 4-6, wherein said pH buffering component is in an amount of from 0.5% to 9% by weight, preferably 0.5% to 5% by weight of the liquid composition or in an amount of from 3% to 30% by weight, preferably from 5% to 25% by weight of the solid composition.

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8. A bleaching composition or use according to any one of claims 1-7, wherein said hypochlorite bleach is, for liquid bleaching compositions, an alkali metal sodium hypochlorite or, for solid compositions, sodium dichloroisocyanurate and/or calcium hypochlorite.

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9. A bleaching composition or use according to any one of claims 1-8, wherein said hypochlorite, based on active halide, is present in an amount of from 0.1% to 20% by weight, preferably from 2% to 8% by weight of the liquid composition or in an amount of from 20% to 95% by weight, preferably from 25% to 60% by weight of the solid composition.

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10. A bleaching composition or use according to any one of claims 1-9, wherein said composition further comprises a strong source of alkalinity.

11. A bleaching composition or use according to any of the preceding claims wherein said anionic surfactant is present in amounts of from 0.1 to 10, preferably 0.1 to 5 by weight of the total composition.

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12. A bleaching composition or use according to any of the preceding claims, wherein said composition is liquid and comprises a co-surfactant or hydrotrope to solubilize said anionic surfactant.

13. A process for preparing a composition according to claim 12 wherein said anionic and said co-surfactant or hydrotrope are first mixed to form a premix, before said premix is mixed with the remainder of the composition which has been prepared separately.

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14. A process of bleaching fabrics with a composition according to any of the claims 1, 3 and 5-12, where said fabrics

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are immersed in a bleaching solution formed by diluting said composition in water.

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