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(54) **CLEANING OF TOILET BOWLS USING LIQUID HYPOCHLORITE COMPOSITIONS**

REINIGUNG VON TOILETTENBECKEN MITTELS FLÜSSIGER
HYPOCHLORITZUSAMMENSETZUNGEN

NETTOYAGE DE CUVETTE DE WC AU MOYEN DE COMPOSITIONS D'HYPOCHLORITE
LIQUIDES

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(73) Proprietor: **S.C. JOHNSON & SON, INC.**
Racine, Wisconsin 53403 (US)

(72) Inventors:
• **CALLAGHAN, Ian, C.**
Berkshire RG4 11JQ (GB)
• **MOODYCLIFFE, Timothy, I.**
Sunbury-On-Thames Middlesex TW16 7BD (GB)
• **AVERY, Richard, W.**
High Wycombe
Buckinghamshire HP14 4EB (GB)

(74) Representative: **Jones, Alan John et al**
CARPMAELS & RANSFORD
43 Bloomsbury Square
London, WC1A 2RA (GB)

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- **DATABASE WPI Week 8641 Derwent**
Publications Ltd., London, GB; AN 86-269643
XP002071880 & JP 61 197 699 A (KAO) , 1
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- **DATABASE WPI Week 8641 Derwent**
Publications Ltd., London, GB; AN 86-269641
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Description

Technical Field

[0001] The present invention relates to a process for cleaning toilet bowls and to a composition, having bleaching and lime scale removal properties, which is particularly suitable for use in the method.

Background Art

[0002] Compositions based on hypochlorite bleach are well-known for use in cleaning hard surfaces which are subject to staining and in particular they are known for use as toilet cleaners. The bowls of flushable toilets are subject to deposition of lime scale in hard water areas. This lime scale is predominantly calcium carbonate but may become discoloured by incorporation of coloured metal ions such as ions of Fe, Mn and by bacterial films and human waste deposits on the lime scale or on the surface of the toilet bowl. Aqueous solutions of sodium hypochlorite, usually containing a thickener to increase viscosity, are widely used in treating toilet bowls. The hypochlorite bleaches the lime scale so that it is less noticeable but does not remove it. The hypochlorite also acts as a disinfectant and users often rely on the odour of chlorine released by hypochlorite bleaches as confirmation that disinfection is taking place.

[0003] It is possible to remove lime scale by the action of acids but there is a risk of the release of excessive quantities of toxic chlorine gas if such acidic cleaners are inadvertently mixed with sodium hypochlorite bleach. When used alone such acidic cleaners do not produce the slight chlorine odour which reassures users that the toilet bowl is being disinfected. However, there has been no consideration of the possibility of providing some ability to remove lime scale in a hypochlorite bleach.

[0004] Sodium salts are generally the cheapest of the alkali and alkali metal salts (with the exception of such insoluble materials as calcium and magnesium carbonates) and in general sodium salts are used whenever a water soluble alkali metal or alkaline earth metal salt is required unless there is some known reason for using another salt. The case of hypochlorite bleaches is no exception and the commercially available toilet cleaners based on hypochlorite bleach use sodium hypochlorite.

[0005] Derwent WPI abstract accession number 87-032288/05 of JP-A-61-287995 discloses a two-pack cleaning composition for a flush toilet. One pack comprises bleaching agent and the other pack comprises non-ionic surfactant, water-soluble inorganic salt and water-insoluble inorganic salt. The bleaching agent may be NaClO, KClO, LiClO, Ca hypochlorite, or Na or K dichloroisocyanurate. The use of a two pack composition will be inconvenient. The abstract does not suggest that the use of hypochlorites other than NaOCl has any advantages which would justify the increased cost.

[0006] Derwent WPI abstract accession number 87-032283/05 of JP-A-61-287990 discloses a cleaning composition which may be used in flushing toilets, and may be in the form of a liquid, solid, paste, or granules.

It comprises a chlorine bleach and an alkali metal alkyl succinate. The chlorine bleach may be calcium hypochlorite, or sodium or potassium dichloroisocyanurate.

[0007] The chlorine bleaches disclosed in this abstract have low solubility in water and are generally supplied commercially as solids. However an important market for chlorine bleaches is as pourable liquids which are poured by the user into the toilet bowl. For this purpose chlorine bleaches having high solubility in water are desirable, namely the water soluble hypochlorite bleaches. The abstract contains nothing which suggests that the use of potassium as opposed to sodium dichloroisocyanurate gives any advantage in lime scale removal. As the first chlorine bleach mentioned is calcium hypochlorite the abstract does not appear to be concerned with the problems caused by the presence of calcium ions.

[0008] It is known that various compounds will sequester metal ions, including calcium ions. However, sequestering agents are usually employed to prevent metal ions, such as calcium, precipitating from aqueous solution. In a conventional liquid toilet cleaner poured by the user from a container into the bowl of a flushing toilet, the only water affected by the contents of the liquid cleaner is the water initially held in the toilet bowl and the first flush of water used to remove the toilet cleaner. Most of the water passing through the toilet bowl will be unaffected by the contents of the liquid cleaner. There would thus appear to be no advantage in introducing sequestering agents into conventional liquid hypochlorite bleach.

[0009] JP 61-197697 (Kao Corp.) discloses a flush toilet cleaner composition comprising 0.1-60 wt% water-soluble substance selected from polycarbonic acid polymers, hydroxypolycarbonic acids, polyamino sulphonic acids and their derivatives of average molecular weight of 100-1500; and 0.5-80 wt% decolourant, preferably one of the hypochlorites, percarbonates or perphthalates.

[0010] JP 61-197699 (Kao Corp.) discloses a two separate agent type cleaner composition for a flush toilet comprising (A) a chlorine decolourant, preferably a hypochlorite; and (B) a solid- or paste-form agent consisting of 0.1 to 60% of a water-soluble organic material selected from polycarbonic acid polymers, aminopolycarbonic acids, hydroxypolycarbonic acids, polyamino phosphonic acids and their derivatives with an average molecular weight of 100-1500; and 0.1 to 30 wt% of a colouring matter which is decoloured in the coexistence with a chlorine decolourant.

[0011] FR 2580625 (L'Oreal SA) discloses a composition for removing scale or inhibiting scale formation comprising a mixture of (a) an anti-scaling agent and (b)

a sequestering agent.

[0012] We have now found that the bowls of flushing toilets can be more effectively cleaned by treating them with a liquid hypochlorite bleach with a defined additive.

Disclosure of Invention

[0013] According to one aspect of the present invention there is provided a method of cleaning a flushable toilet bowl which comprises

- a) pouring into the interior of the toilet bowl from a container an aqueous liquid composition comprising a hypochlorite bleach wherein at least 50% by weight of the hypochlorite present is potassium hypochlorite; and a bleach-resistant organic sequestering agent having a molecular weight below 1500 which sequesters calcium, and
- b) subsequently flushing the toilet.

[0014] The process makes use of a single pack pourable liquid composition. If it contains more than one phase then the phases should be so dispersed that they are stable on storage. Preferably the composition is a homogeneous liquid phase, which may have a high viscosity.

[0015] The hypochlorite bleach used in the process of the present invention may be potassium hypochlorite or a mixture of potassium hypochlorite and sodium hypochlorite providing that at least 50% by weight of the hypochlorite present is potassium hypochlorite.

[0016] The hypochlorite bleach includes potassium hypochlorite. As the composition is an aqueous solution the potassium ions are not directly associated with the hypochlorite ions in solution. Where other metal cations are present in solution the quantity of potassium hypochlorite is taken to be that corresponding to matching all the available potassium with all the available hypochlorite. If there is an excess of potassium ions then the amount of hypochlorite will determine the amount of potassium hypochlorite considered to be present. If there is an excess of hypochlorite then the amount of potassium ions will determine the amount of potassium hypochlorite considered to be present. At least 50% by weight of the hypochlorite present is present as potassium hypochlorite, preferably at least 60%, more preferably at least 80% of the hypochlorite is present as potassium hypochlorite. Preferably all the hypochlorite is present as potassium hypochlorite and hypochlorite is the only chlorine bleaching agent present. Potassium hypochlorite may be the sole hypochlorite used to manufacture the toilet cleaner composition for use in the invention.

[0017] The composition contains a sequestering agent to sequester metal cations especially calcium ions but also iron and manganese ions. The sequestering agent is bleach-resistant i.e. it must of course be sufficiently stable in the presence of chlorine bleach to retain

a useful level of sequestering activity after storage.

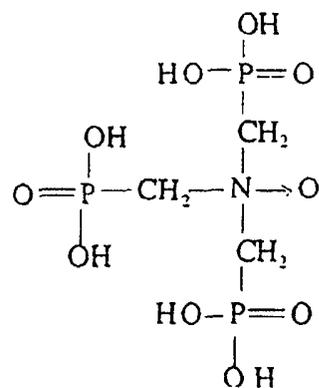
[0018] Certain polymers containing carboxylic acid groups have activity as crystal growth modifiers, i.e. they modify the growth of crystals which could lead to scale formation so that the crystals are retained in suspension and are not deposited. Such polymers are, however, not satisfactory for removing scale which has already formed. The sequestering agents of the present invention have molecular weights (weight average molecular weight) of below 1500, preferably below 1000, more preferably below 500.

[0019] The sequestering agents will preferably contain a hetero-atom, i.e. an atom other than carbon, which atom is bonded to at least two other atoms, preferably carbon atoms. Examples of hetero-atoms are N, P, S, O, B, Si. The preferred hetero-atoms are N, P, and S.

[0020] A common way of comparing the effectiveness of sequestering agents is on the basis of the stability of the complex formed. If M_{+n} is the metal ion, L_{-m} is the sequestering agent, and $ML_{(n-m)}$ is the complex then the equilibrium constant is $K_e = ML_{(n-m)} / (M_{+n})(L_{-m})$. The stability constant is $\log K_e$. Sequestrants with stability constants for calcium in the range 3 to 12, preferably 4 to 11, are preferred.

[0021] As stated above the sequestering agent is bleach-resistant. Sequestering agents containing nitrogen atoms are often attacked by hypochlorite. However in the compound $MeN(CH_2CO_2Na)_2$, which is commercially available as "Biohamp DA" the N atom is protected by steric hindrance. A similar compound which contains an S atom, not an N atom, is $HO_2CCH_2CH(CO_2H)SCH_2CO_2H$ commercially available as "Biohamp MS".

[0022] A preferred class of sequestering agents are the phosphonate sequestering agents. An example of a phosphonate sequestering agent is 1-hydroxyethylidene (1,1-diphosphonic acid). This is not completely stable in hypochlorite solutions. Among preferred phosphonate sequestering agents are the salts of N-oxides of nitrilo tris(methylene phosphonic acid). The free acid has the formula



[0023] The sequestering agent is preferably a potas-

sium salt of a phosphonate.

[0024] As explained above the composition is a single pack composition. It is added to the toilet bowl as an aqueous solution from the container in which it is supplied.

[0025] In addition to the hypochlorite bleach the composition may contain a salt of a weak acid, the salt giving an alkaline pH in aqueous solution. The use of such salts gives a buffering action which assists in the control of pH during manufacture of the composition. The salt may for example be potassium carbonate or potassium borate.

[0026] The composition is preferably applied to the toilet bowl as an aqueous solution of high viscosity so that it will cling to the interior of the toilet bowl. The high viscosity may be obtained by means of a thickening system. Thus, for example, combinations of various surface active agents may be used to give a high viscosity gel-like product.

[0027] It may be desirable to avoid the use of liquid cleaners with excessively high viscosity as the diffusion of ions to and from the deposits on the toilet bowl may be hindered. Thus it may be preferred to use a cleaner with a viscosity of less than 1000 cps (centipoise second), more preferably less than 400 cps, most preferably less than 300 cps. The viscosities given above are measured using a Brookfield viscometer (SP2, 12 rpm, 30 seconds, at 25°C)

[0028] The proportion of potassium cations in the metal cations in solution in the composition is preferably at least 10% of the total number of cations moles present, more preferably at least 30%, most preferably at least 40% of the total number of cations moles present. The metal cations present in the composition are preferably predominantly potassium ions.

[0029] Preferably the solution contains potassium ions in excess of the amount required to correspond to the hypochlorite anions present. In other words the composition is preferably prepared using a potassium compound in addition to potassium hypochlorite.

[0030] Where an ingredient is available in the form of the acid it will be desirable to provide sufficient free alkali when preparing the aqueous solution to neutralize the acid preferably to give the potassium salt.

[0031] The amount of hypochlorite bleach in the composition is preferably in the range 0.5% to 12% wt/wt, measured as active material, more preferably 1% to 8% wt/wt.

[0032] The pH is preferably in the range 10-13.5, more preferably 11.5 to 13.

[0033] The amount of sequestering agent is preferably in the range 1 to 20% by weight, based on weight of active material, more preferably in the range 1 to 10%, most preferably 2% to 6% wt/wt.

[0034] The composition may contain a perfume. The perfume used must be resistant to attack by chlorine bleach, but such perfumes are commercially available.

Best Mode of Carrying Out the Invention

[0035] The invention will now be illustrated by reference to the following experiments in which examples of the invention are identified by number and comparative tests not according to the invention are identified by letter.

[0036] In these experiments the results of the marble cube test are reported. The marble cube test is carried out as follows. A marble cube is washed with tap water and a paper towel is used to remove excess water. The cube is placed in a foil dish, allowed to dry in an oven overnight, and then removed and allowed to cool to ambient temperature. The cube is then weighed. A sample (100g) of the product to be tested is placed in a 250 ml conical flask. The marble cube is then placed in the product and the flask left for approximately 18 hours. The cube is then removed from the flask, rinsed thoroughly with deionized water, blotted dry with a paper towel and placed in the foil dish. The dish is placed in the oven overnight to allow the marble cube to dry. The cube was then re-weighed to determine the weight lost (if any).

Comparative Test A

[0037] A standard commercially available thickened sodium hypochlorite bleach was tested for its ability to remove lime scale removal using the marble cube test. The bleach concentration was 10%wt/wt. No detectable loss of weight of the marble cube took place.

Example I

[0038] A liquid hypochlorite bleach cleaning liquid was prepared as follows. Deionized water (74.5 parts by weight) was introduced into a vessel provided with a stirrer. A sequestering agent (5 parts by weight)(pbw) was then added. The sequestering agent was a commercially product sold under the trade name "Dequest 2010". It contained 60% by weight of the active ingredient HEDP (1-hydroxyethylidene (1, 1-diphosphonic acid)). An aqueous solution of KOH((20% by weight) was then added in an amount sufficient to give a pH of 8. Potassium carbonate (0.5 pbw) was added. Three surfactants were then added to thicken the aqueous liquid. The first was sodium lauryl ether sulphate (3.5pbw of 27% active material), the second was sodium lauryl sarcosinate (1 pbw of 30% active material). The third was a C12 amine oxide surfactant (4.5 pbw of 30% active material) sold under the trade name "Empigen OB".

[0039] Sufficient KOH solution was added to raise the pH to 13. KOCl (10.5 pbw of 20% wt/wt solution) was then added, and 0.25 pbw of perfume, to give a total of 100 pbw.

[0040] The resulting liquid was clear, had a pH of 13.49, a viscosity of 150 cps measured using a Brookfield viscometer (SP2, 12 rpm, 30 seconds, at 25°C),.

The average of two results for the marble cube test was 0.68% dissolved.

Example 2

[0041] A thickened toilet cleaning composition was prepared as in Example 1 except that the quantity of deionized water was 65.75 pbw, the quantity of sodium lauryl ether sulphate was 7 pbw, the quantity of sodium lauryl sarcosinate was 2 pbw, and the quantity of amine oxide surfactant was 9 pbw.

[0042] The resulting liquid was clear, had a pH of 13.25 and a viscosity of 275 cps. The marble cube test result was 0.41 % dissolved.

Example 3

[0043] An experiment was carried out as in Example 1 except that neither surfactants nor perfume were added and the quantity of deionized water was increased to 84 pbw to bring the total up to 100 pbw.

[0044] The resulting liquid was clear, had a pH of 13.70, and was water-thin. The marble cube test result was 0.81 % dissolved.

Example 4

[0045] An experiment was carried out as in Example 3 except that the sequestering agent was the N-oxide of nitrilo tris(methylene phosphonic acid) in its potassium salt form (12pbw) commercially available as "Briquest 3010-25K" from Albright & Wilson, and containing 25% of active material. The amount of water was adjusted to 77 pbw.

[0046] The product was clear, had a pH of 13.5, and was water thin. The marble-cube test result was 0.67% dissolved.

Example 5

[0047] An experiment was carried out as in example 3 but using a mixture of the "Dequest 2010" sequestering agent (2.5 pbw) of Example 1 and the "Briquest" surfactant (6 pbw) of example 4, with the amount of deionized water adjusted to 80.5 pbw.

[0048] The product was clear, had a pH of 13.5, and was water thin. The marble cube test result was 0.61 % dissolved.

Example 6

[0049] An experiment was carried out as in Example 3 except that the sequestering agent was MeN (CH₂CO₂Na)₂, which is commercially available as "Biohamp DA" (3 pbw, 100% active material), and the amount of water was 86 pbw.

[0050] The product was dear, had a pH of 13.4, and was water thin. The marble cube test result was 0.06%

dissolved.

[0051] Thus the product had some lime scale activity but was not as active as the products containing phosphonic acid sequestering agents.

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Example 7

[0052] An experiment was carried out as in Example 3 but using a mixture of the sequestering agent of example 1 ("Dequest 2010) (2.50 pbw) and that of Example 6 ("Biohamp DA" (1.50 pbw).

[0053] The product was clear, had a pH of 13.8, and was water thin. The marble cube test result was 0.33% dissolved.

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Comparative Example 8

[0054] An experiment was carried out as in Example 4 except that the KOCl was replaced by NaOCl (14 pbw of 15% wt/wt solution) with the amount of deionized water adjusted to 73.5 ppw. The composition still contained potassium ions as a result of neutralization with KOH and the use of potassium carbonate.

[0055] The product was clear, had a pH of 12.90, and was water thin. The marble cube test result was 0.55 % dissolved.

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[0056] This shows that quite high removal of time scale is possible without the use of KOCl. A comparison of Examples 4 and 8 shows the superior results obtained using KOCl.

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Comparative Example 9

[0057] An experiment was carried out as in Example 5 but replacing the KOCl with NaOCl (14 pbw of 15% wt/wt solution) and adjusting the deionized water to 77 pbw.

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[0058] The product was clear, had a pH of 12.8, and was water thin. The marble cube test result was 0.16% dissolved.

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Comparative Example 10

[0059] An experiment was carried out as in Example 6, except that the KOCl was replaced by NaOCl (14 pbw of 15% wt/wt solution).

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[0060] The product was clear, had a pH of 13.5 and was water thin. The marble cube test result was 0,23 % dissolved.

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Comparative Example 11

[0061] An experiment was carried out as in Example 3 except that the neutralizations to pH 8 and pH 13 were carried out using NaOH instead of KOH, sodium carbonate 0.5pbw) was added instead of potassium carbonate, and NaOCl (14 pbw of 15% wt/wt solution) was used instead of KOCl. The quantity of deionized water was

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adjusted to 80.5 pbw.

[0062] The product was clear, had a pH of 12.90 and was water thin. The marble cube test result was 0.26 % dissolved.

[0063] A comparison of these results with those for Example 3 shows the superiority of the product based on KOH and KOCl when used with phosphonate sequestering agents.

Comparative Example 12

[0064] An experiment was carried out as in Example 4 but with the changes set out in Example 11, and the amount of deionized water adjusted to 73.5 pbw.

[0065] The product was clear, had a pH of 12.7 and was water thin. The marble cube test result was 0.31% dissolved.

[0066] A comparison of these results and those for Example 4 shows the benefits of the product based on KOH and KOCl when used with phosphonate sequestering agents.

Comparative Example 13

[0067] An experiment was carried out as in Example 5 but with the changes set out in Example 11, and with the amount of deionized water adjusted to 77 pbw.

[0068] The product was clear, had a pH of 12.85 and was water thin. The marble cube test result was 0.29% dissolved.

[0069] A comparison of this result with that for Example 5 shows the superiority of the product based on potassium salts when used with phosphonate sequestering agents.

Comparative Example 14

[0070] An experiment was carried out as in Example 6 but with the changes set out in Example 11, and the deionized water content adjusted to 82.5 pbw.

[0071] The product was clear, had a pH of 12.95 and was water thin. The marble cube test result was 0.06 % dissolved.

Claims

1. A method of cleaning a flushable toilet bowl which comprises

a) pouring into the interior of the toilet bowl from a container an aqueous liquid composition comprising a hypochlorite bleach wherein at least 50% by weight of the hypochlorite present is potassium hypochlorite; and a bleach-resistant organic sequestering agent having a molecular weight below 1500 which sequesters calcium, and

b) subsequently flushing the toilet.

2. A process according to claim 1 wherein at least 60% of the hypochlorite present is potassium hypochlorite.

3. A process according to claim 1 wherein all the hypochlorite is present as potassium hypochlorite.

4. A process according to claim 1 wherein the sequestering agent has a molecular weight below 1000.

5. A process according to claim 1 wherein the sequestering agent has a molecular weight below 500.

6. A process according to any one of the preceding claims wherein the sequestering agent contains a hetero-atom.

7. A process according to claim 6 wherein the hetero-atom is bonded to at least two carbon atoms.

8. A process according to claim 7 wherein the hetero-atom is N, P, or S.

9. A process according to any one of the preceding claims wherein the sequestering agent has a stability constant for calcium in the range 3 to 12.

10. A process according to claim 9 wherein the stability constant is in the range 4 to 11.

11. A process according to any one of the preceding claims wherein the sequestering agent is a phosphonate sequestering agent.

12. A process according to claim 11 wherein the phosphonate sequestering agent is a salt of an N-oxide of nitrilo tris(methylene phosphonic acid).

13. A process according to any one of the preceding claims wherein the proportion of potassium ions in the metal cations in solution in the composition is at least 10% of the total number of cations moles present.

14. The process according to claim 13 wherein the proportion of potassium ions is at least 40% of the total number of cations moles present.

15. A process according to any one of the preceding claims wherein the composition contains potassium ions in excess of the amount required to correspond to the hypochlorite ions present.

16. The process according to any one of the preceding claims wherein the amount of hypochlorite bleach in the composition is in the range of from 0.5% to

12% by weight measured as active material.

17. The process according to any one of the preceding claims wherein the pH is in the range 10 to 13.5.
18. The process according to any one of the preceding claims wherein the composition contains 1 to 20% by weight of sequestering agent, based on weight of active material.
19. A single pack pourable aqueous liquid hypochlorite bleach cleaning composition **characterised in that** the aqueous cleaning composition comprises a hypochlorite bleach, wherein at least 50% by weight of the hypochlorite comprises potassium hypochlorite; and a bleach-resistant organic sequestering agent having a molecular weight below 1500 which sequesters calcium.

Patentansprüche

1. Verfahren zum Reinigen einer abspülbaren Toilettenschüssel, das umfasst
- (a) das Gießen einer wässrigen flüssigen Zusammensetzung, die umfasst ein Hypochlorit-Bleichmittel, in dem mindestens 50 Gew.-% des Hypochlorits als Kaliumhypochlorit vorliegen, und ein Bleichmittel-beständiges organisches Sequestrieremittel mit einem Molekulargewicht unter 1500, das mit Calcium einen löslichen Komplex bildet, aus einem Behälter in das Innere der Toilettenschüssel und
- (b) das anschließende Spülen der Toilette.
2. Verfahren nach Anspruch 1, worin mindestens 60 % des Hypochlorits als Kaliumhypochlorit vorliegen.
3. Verfahren nach Anspruch 1, worin das gesamte Hypochlorit als Kaliumhypochlorit vorliegt.
4. Verfahren nach Anspruch 1, worin das Sequestrieremittel ein Molekulargewicht unter 1000 hat.
5. Verfahren nach Anspruch 1, worin das Sequestrieremittel ein Molekulargewicht unter 500 hat.
6. Verfahren nach einem der vorhergehenden Ansprüche, worin das Sequestrieremittel ein Heteroatom enthält.
7. Verfahren nach Anspruch 6, worin das Heteroatom an mindestens zwei Kohlenstoffatome gebunden ist.
8. Verfahren nach Anspruch 7, worin das Heteroatom

N, P oder S ist.

9. Verfahren nach einem der vorhergehenden Ansprüche, worin das Sequestrieremittel eine Stabilitätskonstante für Calcium in dem Bereich von 3 bis 12 aufweist.
10. Verfahren nach Anspruch 9, worin die Stabilitätskonstante in dem Bereich von 4 bis 11 liegt.
11. Verfahren nach einem der vorhergehenden Ansprüche, worin das Sequestrieremittel ein Phosphonat-Sequestrieremittel ist.
12. Verfahren nach Anspruch 11, worin das Phosphonat-Sequestrieremittel ein Salz eines N-Oxids der Nitrolo-tris(methylenphosphonsäure) ist.
13. Verfahren nach einem der vorhergehenden Ansprüche, worin der Anteil der Kaliumionen an den in der Zusammensetzung in Lösung vorliegenden Metallkationen mindestens 10 % der Gesamtanzahl der vorhandenen Mole an Kationen beträgt.
14. Verfahren nach Anspruch 13, worin der Anteil der Kaliumionen mindestens 40 % der Gesamtanzahl der vorhandenen Mole an Kationen beträgt.
15. Verfahren nach einem der vorhergehenden Ansprüche, worin die Zusammensetzung Kaliumionen im Überschuss gegenüber der Menge enthält, die erforderlich ist, um den vorhandenen Hypochloritionen zu entsprechen.
16. Verfahren nach irgendeinem der vorhergehenden Ansprüche, worin die Menge des Hypochlorit-Bleichmittels in der Zusammensetzung in dem Bereich von 0,5 bis 12 Gew.-%, bestimmt als aktives Material, liegt.
17. Verfahren nach irgendeinem der vorhergehenden Ansprüche, worin der pH-Wert in dem Bereich von 10 bis 13,5 liegt.
18. Verfahren nach irgendeinem der vorhergehenden Ansprüche, worin die Zusammensetzung 1 bis 20 Gew.-% Sequestrieremittel, bezogen auf das Gewicht des aktiven Materials, enthält.
19. Gießbare wässrige flüssige Hypochlorit-Bleichmittel-Reinigungszusammensetzung als Einzelverpackung, **dadurch gekennzeichnet, dass** die wässrige Reinigungszusammensetzung umfasst ein Hypochlorit-Bleichmittel, in dem mindestens 50 Gew.-% des Hypochlorits als Kaliumhypochlorit vorliegen, und ein Bleichmittel-beständiges organisches Sequestrieremittel mit einem Molekulargewicht unter 1500, das mit Calcium einen löslichen

Komplex bildet.

Revendications

1. Procédé pour le nettoyage d'une cuvette de toilettes rinçable qui comprend les étapes consistant
 - a) à verser à l'intérieur de la cuvette de toilettes à partir d'un récipient une composition liquide aqueuse comprenant un agent blanchissant d'hypochlorite dans laquelle au moins 50 % en poids de l'hypochlorite présent est de l'hypochlorite de potassium ; et un agent séquestrant organique résistant à l'agent blanchissant ayant un poids moléculaire inférieur à 1500 qui séquestre le calcium, et
 - b) à rincer ensuite les toilettes.
2. Procédé selon la revendication 1, dans lequel au moins 60 % de l'hypochlorite présent sont de l'hypochlorite de potassium.
3. Procédé selon la revendication 1, dans lequel la totalité de l'hypochlorite est présent dans la forme d'hypochlorite de potassium.
4. Procédé selon la revendication 1, dans lequel l'agent séquestrant présente un poids moléculaire inférieur à 1000.
5. Procédé selon la revendication 1, dans lequel l'agent séquestrant présente un poids moléculaire inférieur à 500.
6. Procédé selon l'une quelconque des revendications précédentes, dans lequel l'agent séquestrant contient un hétéro-atome.
7. Procédé selon la revendication 6, dans lequel l'hétéro-atome est lié à au moins deux atomes de carbone.
8. Procédé selon la revendication 7, dans lequel l'hétéro-atome est N, P ou S.
9. Procédé selon l'une quelconque des revendications précédentes, dans lequel l'agent séquestrant présente une constante de stabilité pour le calcium dans l'intervalle de 3 à 12.
10. Procédé selon la revendication 9, dans lequel la constante de stabilité se trouve dans l'intervalle de 4 à 11.
11. Procédé selon l'une quelconque des revendications précédentes, dans lequel l'agent séquestrant est un agent séquestrant de phosphanate.
12. Procédé selon la revendication 11, dans lequel l'agent séquestrant de phosphanate est un sel d'un N-oxyde de nitrilotris(acide méthylène phosphonique).
13. Procédé selon l'une quelconque des revendications précédentes, dans lequel la proportion d'ions potassium dans les cations métalliques en solution dans la composition est d'au moins 10 % du nombre total de moles de cations présentes.
14. Procédé selon la revendication 13, dans lequel la proportion d'ions potassium est d'au moins 40 % du nombre total de moles de cations présentes.
15. Procédé selon l'une quelconque des revendications précédentes, dans lequel la composition contient des ions potassium en excès de la quantité nécessaire pour correspondre aux ions hypochlorite présents.
16. Procédé selon l'une quelconque des revendications précédentes, dans lequel la quantité d'agent blanchissant d'hypochlorite dans la composition se trouve dans l'intervalle de 0,5 % à 12 % en poids mesurée comme matière active.
17. Procédé selon l'une quelconque des revendications précédentes, dans lequel le pH se trouve dans l'intervalle de 10 à 13,5.
18. Procédé selon l'une quelconque des revendications précédentes, dans lequel la composition contient de 1 à 20 % en poids d'agent séquestrant, rapportés au poids de matière active.
19. Composition nettoyante d'agent blanchissant d'hypochlorite liquide aqueuse pouvant être versée, en un seul paquet, **caractérisée en ce que** la composition nettoyante aqueuse comprend un agent blanchissant d'hypochlorite, dans laquelle au moins 50 % en poids de l'hypochlorite comprennent de l'hypochlorite de potassium ; et un agent séquestrant organique résistant à l'agent blanchissant ayant un poids moléculaire inférieur à 1500 qui séquestre le calcium.