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(54) Sanitizer.

(57) Liquid sanitizer compositions having a reduced corrosion tendency comprise at least 2% by weight of a caustic agent, from 0 to 1% of a surfactant and at least 3% by weight of a hypohalite bleach and an amount of an alkali metal neutral silicate such that the weight ratio of silicate ions to free halogen is at least 1:5 and the weight ratio of the hypohalite bleach to other water-soluble electrolyte in the composition is at most 1:1.

EP 0 311 175 A2

SANITIZER

The present invention is concerned with a sanitizing product which contains a hypohalite bleach.

In industrial machines for bulk warewashing or fabrics washing, it is often desired to add a bleach-based sanitizing product during one or more wash cycles, to ensure an acceptable level of hygiene.

Unfortunately, for optimum sanitizing performance and acceptable cost, it is necessary to use a hypohalite bleach which, with prolonged use, can lead to spot corrosion of some stainless steel parts. This especially occurs when the machine is not operating, and particularly at spots which are near the spray nozzles for the sanitizer solution.

Although it has been known in the past to use an agent like sodium metasilicate to inhibit corrosion, there are problems in using this effectively in sanitizers of the aforementioned kind. First, any putative corrosion inhibitor must be soluble in an aqueous liquid (such sanitizers must be dosed as liquids). Second, an insufficient level of such inhibitor actually increases corrosion as compared to that observed with equivalent products totally devoid of any inhibitor. Third, at effective levels of inhibitor, there is a real danger of premature decomposition of the bleach.

We have now found that these problems can be overcome by providing a liquid sanitizer composition comprising at least 2% by weight of a caustic agent, from 0 to 1% of a surfactant and at least 3% by weight of a hypohalite bleach and an amount of an alkali metal neutral silicate such that the weight ratio of silicate ions to free halogen is at least 1:5 and the weight ratio of the hypohalite bleach to other water-soluble electrolyte in the composition is at most 1:1.

Hypohalites, such as sodium hypochlorite, exert their sanitizing action by release of free oxygen to leave sodium chloride. Commercially available hypochlorites do indeed contain trace impurities of the corresponding chloride. Thus, in the context of the present invention, the term "free halogen" means the total halogen in the composition, whether as a halide ion or in the form of the corresponding hypohalite.

Commercially available hypochlorite compositions are characterized by their content of "available chlorine". Methods for determining the "available chlorine" of compositions containing chlorine bleach are well known in the art. In accordance with usual practice, the available chlorine is defined in this application as the amount of chlorine which can be liberated from a composition by acidification and addition of at least one molar equivalent of chloride ions.

For the best corrosion inhibition performance, it is preferred that the weight ratio of silicate ions to free halogen is from 1:5 to 1:1.5.

To guard against premature decomposition of the bleach, it is most preferred that the weight ratio of hypohalite bleach to other water-soluble electrolyte in the composition is from 1:2 to 1:1.

The most preferred hypohalite bleaches are the alkali metal hypochlorites, especially the sodium salt.

Preferably also, to inhibit calcium deposits on metal surfaces, especially aluminium, the composition further comprises from 1 to 5% of an alkali metal condensed phosphate builder, such as sodium or potassium tripolyphosphate.

For optimum bleach stability and performance, it is also preferred that the pH of the composition is at least 12.0.

The caustic agent in the composition is an alkali metal hydroxide or metasilicate, such as sodium hydroxide, potassium hydroxide, sodium metasilicate or potassium metasilicate. The relative amount of sodium and potassium ions in the total composition should be chosen such that there is no precipitation of any tripoly phosphate present, in the form of a precipitate of the sodium salt.

The surfactant, which may be present in an amount of 0.1% by weight, is essentially a foam depressor.

The term alkali metal neutral silicate means one in which the ratio of silicate to alkali metal oxide species is greater than 3:1. A typical example is sodium neutral silicate having an SiO_2:Na_2O ratio of 3.4:1.

The present invention will now be explained better by way of the following Examples.

Examples 1-8

The following compositions were formulated using 6% by weight of a concentrated stock solution of potassium hydroxide containing 50% by weight of potassium hydroxide, and 31.3% by weight of a concentrated stock solution of sodium hypochlorite containing 19.2% by weight of sodium hypochlorite (calculated as available chlorine).

Examples 1-4 were formulated using a low sodium chloride impurity bleach, whereas Examples 5-8

were formulated using a regular grade, resulting in NaCl contents in the total composition of 3 and 5% by weight, respectively.

The sodium silicate was added as a concentrated stock solution containing 34% by weight of active SiO_2:Na_2O in a ration of 3.4:1.

The solution was applied neat to stainless steel discs and left for sufficient time for visible corrosion to be apparent. The corrosion apparent was rated on an arbitrary scale of 1-10 where 1 refers to no corrosion and 10 refers to severe attack.

Examples 9-12

The following compositions were prepared using the same stock solutions as in Examples 1-8, but additionally containing potassium tripolyphosphate. The latter was added as a concentrated stock solution containing 50% by weight of potassium tripolyphosphate. Clear solutions were obtained without any signs of precipitates being formed. The corrosion ratings were similar to those of Examples 1-4 or 5-8, depending on the amount of NaCl impurity of the sodium hypochlorite solution used.

Ex	Wt.% silicate*	Wt.% SiO_2	Wt.% NaCl Impurity	Wt. ratio SiO_2 : free halogen	Wt. ratio bleach : other electrolyte	Corrosion rating
1	0	0	3.0	-	1:0.95	6
2	4	1.05	"	1:4.59	1:1.17	1
3	8	2.10	"	1:2.30	1:1.38	2
4	12	3.15	"	1:1.53	1:1.60	2
5	0	0	5.0	-	1:1.27	6
6	4	1.05	"	1:5.74	1:1.49	4
7	8	2.10	"	1:2.87	1:1.70	3
8	12	3.15	"	1:1.91	1:1.92	2

* 34% active SiO_2:Na_2O = 3.4:1

	(% by weight)			
	Ex 9	10	11	12
H_2O	59.7	55.7	51.7	47.7
KOH (50%)	6	6	6	6
KTPP (50%)	3	3	3	3
Na-silicate (34%)	0	4	8	12
NaOCl (19.2%)	31.3	31.3	31.3	31.3
pH	13.65	13.60	13.55	13.50

Claims

1. A liquid sanitizer composition comprising at least 2% by weight of a caustic agent, from 0 to 1% of a surfactant and at least 3% by weight of a hypohalite bleach and an amount of an alkali metal neutral silicate such that the weight ratio of silicate ions to free halogen is at least 1:5 and the weight ratio of the hypohalite bleach to other water-soluble electrolyte in the composition is at most 1:1.

2. A composition according to Claim 1, wherein the weight ratio of silicate ions to free halogen is from 1:5 to 1:1:.5.

3. A composition according to Claim 1 or Claim 2, wherein the weight ratio of hypohalite bleach or other water-soluble electrolyte in the composition is from 1:2 to 1:1.

4. A composition according to any preceding Claim, wherein the hypohalite bleach is an alkali metal hypochlorite.

5. A composition according to any preceding Claim, further comprising from 1 to 5% of an alkali metal condensed phosphate builder.

6. A composition according to any preceding Claim, wherein the pH is at least 12.0.

7. A process of mechanical warewashing comprising dosing an effective sanitizing amount of a composition according to any preceding Claim into the wash liquor in a warewashing machine.