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(54) Bleaching composition.

(57) The invention pertains to aqueous liquid thickened chlorine bleaching compositions comprising an alkali metal hypochlorite solution thickened by a combination of at least two different detergent-active components, one of which comprises a trialkylamineoxide having two short alkyl groups and one long chain C_8-C_{18} alkyl group, at least 20% by weight of the amineoxide component having C_{16}-C_{18} alkyl groups. The invention provides improved thickening action and allows reduced levels of the thickening detergent-active system.

EP 0 145 084 A2

BLEACHING COMPOSITION

The present invention relates to a bleaching and cleaning composition, and more in particular to a liquid thickened chlorine bleaching composition which is based on an aqueous solution of alkali metal hypochlorite.

Aqueous solutions of an alkali metal hypochlorite are widely used as disinfectant cleaners for lavatory pans, urinals, drains and waste pipes, but may also be employed in the cleaning and bleaching of fabrics.

In British Patent Specification N° 1 329 086 it has been recognized that the efficiency of such solutions is considerably increased by thickening to viscosities at which they adhere much longer to non-horizontal surfaces, thereby enabling them to perform their bleaching/cleaning function before draining off.

In the British Patent 1 329 086 thickened chlorine bleaching compositions are described, which have an active-chlorine content of 1 to 15% by weight and a thickening detergent-active system comprising an alkali metal salt of a fully saturated C_8-C_{18} fatty acid in combination with, inter alia, a trialkylamineoxide having a straight chain C_8-C_{18} alkyl group and two C_1-C_3 groups.

In general, present-day bleaching products based on the above thickening system contain the commercially available amineoxides derived from naturally occurring fatty acids such as coconut acids, lauric acid and myristic acid.

It has now been found that if a substantial proportion (which will be defined below) of the long-chain alkyl groups of the amineoxide are C_{16}-C_{18} alkyl groups, the

thickening action is significantly improved and accordingly levels of the thickening active system may be reduced. Furthermore it has been found that, in particular if higher proportions of amineoxide have C_{18} alkyl groups, the weight ratio of the amineoxide to the co-active may be decreased, which in general leads to a further reduction in costs.

Accordingly the present invention provides a liquid thickened chlorine bleaching composition comprising an aqueous alkali-metal hypochlorite solution which is thickened by means of a detergent-active mixture comprising a mono(C_8-C_{18})-di(C_1-C_3) alkylamine-oxide, characterized in that at least 20% by weight of the amineoxide component have C_{16}-C_{18} alkyl-groups.

The thickening active system consists of at least two different detergent-active components, one of which comprises a trialkylamineoxide having two short chain C_1-C_3 alkylgroups and a long chain C_8-C_{18} alkylgroup. In order to obtain the advantages of the present invention at least 20%, preferably 20 to 50%, and most preferably 30 to 50% by weight of the amineoxide should contain long chain alkylgroups having 16-18 carbon atoms. Higher proportions of amineoxide having C_{18} alkyl groups have an increasing effect on the cloud point of the composition and in general allow a reduction of the amineoxide/co-active weight ratio. Accordingly it is preferred that in the C_{16}-C_{18} alkylamine-oxide fraction the amount of C_{18}-alkyl exceeds that of C_{16}-alkyl.

The second detergent active component present in the thickener can be an alkalimetal soap or mixture thereof according to British Patent Specification 1 329 086, alkalimetal acylsarcosinates or -alkyltaurides according to British Patent Specification 1 466 560 or sugar esters according to Dutch Patent Application 7 605 328,

or mixtures thereof. Alkali metal C_{10}-C_{18} alkylether (containing 1-10 moles of ethylene- and/or propylene-oxide) sulphates can also be used. However, the mixtures of trialkylamineoxides and alkali metal soaps of fully saturated C_8-C_{18} fatty acids are preferred.

The thickening active system is used in an amount of 0.3-5%, preferably 0.5-3% by weight of the final composition.

The composition may be thickened to a wide range of viscosities, preferably from about 10 to 250 cS or even from about 30 to 150 cS as measured with a U-tube viscosimeter at a temperature of 25°C.

The stability of the composition may be improved by the addition of a small amount, in the order of 0.1-15%, of alkaline agents, such as for example sodium carbonate, trisodium orthophosphate, sodium hydroxide and the like.

The alkali metal hypochlorite will generally be present in the composition in an amount sufficient to provide from 1 to 15%, preferably 2 to 11% and most preferably 5 to 10% by weight of available chlorine on the basis of the total weight of the composition.

Although alkali metal hypochlorites are preferred, other chlorine compounds which yield the hypochlorite ion in alkaline aqueous solution may also be used, e.g. calcium and magnesium hypochlorite, alkali metal dichloro-isocyanurate, chloramines and the like.

Further, the thickened chlorine bleaching compositions according to the invention may contain small amounts of conventional additives, such as hypochlorite-soluble

and stable colorants and perfumes. Small amounts of insoluble solid particles are also tolerable.

The compositions of the invention can be prepared in conventional ways, for example as described in British Patent Specification 1 329 086.

The compositions of the invention are useful for all bleaching purposes, especially for bleaching hard surfaces, such as toilets, tiles, floors, kitchen sinks, etc., where by their thickened nature they adhere longer to the surface than non-thickened bleaching compositions.

The invention will be further illustrated by way of example, in which all percentages are by weight unless otherwise indicated.

The following general composition was used in all examples:

Ingredients	%
Sodium hypochlorite (15% av. Cl_2)	61
Sodium hydroxide	0.7
Perfume	< 0.1
Thickening active system	defined in examples
Water	balance

In Table 1 comparative examples are given, illustrating for products with constant active level the effects of varying amineoxide compositions on viscosity and cloud-point behaviour.

TABLE 1

Ex. N°	Thickening active system (%)				Viscosity (cS) (U-tube, 25°C)	Cloud Point (°C)
	Coco-AO *)	C_{16}-AO	C_{18}-AO	Sodium laurate		
1	0.9150	-	-	0.3270	48	42
2	0.7320	0.1830	-	0.3270	93	39
3	0.5950	0.3200	-	0.3270	109	33
4	0.7320	-	0.1830	0.3270	66	53
5	0.5950	-	0.3200	0.3270	162	53
6	0.4575	-	0.4575	0.3270	436	40
7	0.6862	0.2288	-	0.3270	100	37
8	0.6862	0.1716	0.0572	0.3270	95	38
9	0.6862	0.1144	0.1144	0.3270	95	43
10	0.6862	0.0572	0.1716	0.3270	84	49
11	0.6862	-	0.2288	0.3270	80	53

*) Coco-AO composition: 73% C_{10}-C_{12}-AO, 24% C_{14}-AO, 3% C_{16}-C_{18}-AO.

In Table 2 comparative examples are given illustrating for products having the same viscosity (~45 cS) and cloud point (~43°C) the reduction in active level for varying amine-oxide compositions.

TABLE 2

Ex. N°	Thickening active system (%)				Viscosity (cS) (U-tube, 25°C)	Cloud Point (°C)
	Coco-AO	C_{16}-AO	C_{18}-AO	Sodium laurate		
12	0.6163	0.2054	-	0.3270	45	42
13	0.5584	0.0930	0.0930	0.3270	50	43
14	0.5062	-	0.1688	0.3270	46	43

In Table 3 comparative examples are given illustrating for products having the same cloud point (45°C) the effect on viscosity for varying amineoxide compositions (using mixtures of Coco-AO and Tallow-AO) and reduction in soap level.

TABLE 3

Ex. N°	Thickening active system (%)			Viscosity (cS) (U-tube, 25°C)	Cloud Point (°C)
	Coco-AO	Tallow-AO *)	Sodium laurate		
15	0.700	-	0.255	25	45
16	0.490	0.210	0.244	89	45
17	0.350	0.350	0.233	108	45

*) Tallow-AO composition: 2% C_{12}-AO, 5% C_{14}-AO, 23% C_{16}-AO and 70% C_{18}-AO.

In Table 4 comparative examples are given illustrating for products having the same viscosity (25 cS) the reduction in active system.

TABLE 4

Ex. N°	Thickening active system (%)			Viscosity (cS) (U-tube, 25°C)	Cloud Point (°C)
	Coco-AO	Tallow-AO	Sodium laurate		
18	0.391	0.167	0.178	25	45
19	0.259	0.259	0.144	25	45
20	0.490	0.210	0.255	25	>100
21	0.350	0.350	0.155	25	>100

Examples 20 and 21 show improved foaming behaviour.

In Table 5 comparative examples are given illustrating the effect of varying amineoxide compositions for other co-actives.

TABLE 5

Ex. N°	Thickening active system (%)					Viscosity (cS) U-tube, 25°C	Cloud Point (°C)
	($<C_{16}$)-AO	C_{16}-AO	C_{18}-AO	Na lauroyl sarcosinate	Na lauryl-ether sulphate		
22	1.45	0.03	0.02	-	-	2	>80
23	0.73	0.02	trace	0.75	-	12	>80
24	0.58	0.08	0.09	0.75	-	18	>80
25	0.39	0.09	0.27	0.75	-	34	>80
26	0.17	trace	trace	1.32	-	33	>80
27	0.34	0.05	0.05	1.07	-	33	>80
28	0.23	0.06	0.16	1.05	-	34	>80
29	1.07	0.02	0.01	-	0.60	24	42
30	0.77	0.11	0.11	-	0.37	24	42
31	0.40	0.10	0.27	-	0.19	25	43

CLAIMS

1. A liquid thickened chlorine bleaching composition comprising, in an aqueous solution, alkali metal hypochlorite and at least two different detergent-active components one of which comprises a trialkylamineoxide having two short chain C_1-C_3 alkyl groups and one long chain C_8-C_{18} alkyl group, characterised in that at least 20% of the amineoxide component have a C_{16}-C_{18} alkyl group.

2. A composition according to claim 1, characterised in that 20-50% by weight of the amineoxide component have a C_{16}-C_{18} alkyl group.

3. A composition according to claim 1, characterised in that 30-50% by weight of the amineoxide component have a C_{16}-C_{18} alkyl group.

4. A composition according to any one of the preceding claims, characterised in that the major part of the C_{16}-C_{18} amineoxide consists of amineoxide having a C_{18} alkyl group.

5. A composition according to any one of the preceding claims characterised in that the composition comprises 0.3-5% by weight of the detergent-active components, 0.1-15% by weight of alkaline agents and sufficient alkali metal hypochlorite to provide 1-15% by weight of available chlorine.