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(54) Bleaching composition containing alkaline hypochlorite and process for its manufacture.

(57) Whitening composition with an alkalinic hypochlorite base and the process to obtain this, where the composition consists of a solution of metal alkalinic hypochlorite, with a concentration of 1 to 10% in weight terms of the total weight, in an anionic surface active agent or mixture of surface active agents, where the predominant proportion is that of the anionic surface active agent, of the alkalinic metal alkylether sulphate type, in a concentration of between 0.1 and 10% in weight terms of the total weight; a neutral salt in a proportion of 0 to 4% in weight terms of the total weight, and additives and auxilliary products such as perfumes, optical whiteners and colourants of up to 0.5% in weight terms of the total weight.

The process to obtain this is distinguished by the fact that the mentioned components are mixed in the proportions indicated, in a given case by agitation. The composition obtained in this way is used in the fields of hygiene and disinfection.

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WHITENING COMPOSITION WITH AN ALKALINIC HYPOCHLORITE BASE AND THE PROCESS USED TO OBTAIN THIS

This invention is aimed at manufacturing a whitening composition with a metal alkalinic hypochlorite base and the process used to obtain this. These compositions are used in the fields of hygiene and disinfection.

In the last few years whitening compositions with metal alkalinic hypochorite bases have been acreditted due to the fact that they are remarkably viscous and, therefore, are appropriate for the treatment of not only horizontal and slanted surfaces but also for vertical surfaces since the viscosity of these compositions means that contact between them and the surface to be treated is of much longer duration than that of fluid compositions which rapidly "run" from these surfaces.

This latter problem made it necessary to obtain "viscous" whitening compositions with the aim of increasing the duration of the contact between surfaces to be treated and the cleaning and disinfection compositions.

There have been many State of the Art attempts in this respect and solutions have been sought by means of adding to the alkalinic hypochlorites one or more surface active agents to obtain viscosity levels of 100 to 150 centipoises in the finished product.

The predominant surface active agent used to date has been amine oxide, mixed with other surface active agents, which are generally anionic.

In this same way, US patent 3684 722 proposed the use of amine oxide with betaine, in US patent 4 229 313 the use of mixtures of amine oxides was proposed, and in patent EP 137 871 the use of amine oxides together with other surface active agents was proposed.

In Spanish patent 506 624 the use of amine oxide having the majority proportion was proposed, together with sodium ether sulphate in a lesser proportion, to prepare bleaching agents for use in textile fibre dye baths, with a metal alkalinic hypochlorite base.

All of these compositions recognised by State of the Art prior to this invention, have the disadvantage of giving viscosity levels of 200 centipoises only where their ionic strength is in the region of 4, this being achieved when the alkalinic hypochlorite concentration is in the region of 8 to 9% in weight terms. These concentrations which have, in weight terms, 8 to 9% of alkalinic hypochlorites, have a very high decomposition power on organic products such as surface active agents and hydrotopes, thereby noticeably reducing the stability of the product in relation to its active chlorine content.

Moreover, in the majority of the compositions of this type, recognised by State of the Art, it is possible to observe inadmissable variations in viscosity levels, some of these drops being very marked in some cases.

On the other hand, the reactions of high alkalinic hypochlorite concentrations with the organic products leads to the formation of high quantities of organochlorinated substances (AOX = absorbable organic halogenes) which can reach concentrations in the region of 5.5 ppm (according to analysis method DIN 38409-H 14). These organochlorinated compounds are skin irritant and are not easily biodegradable, for which reason the concentration level of these in sewage waters is strictly controlled by the public health standards in some countries. Therefore, it is desireable to reduce or even eliminate these from sewage waters to improve environmental protection.

This invention has a remedy for all and each one of these disadvantages given that it is based on the use of one sole surface active agent, with secondary surface active agents being used in a given case. In addition, by means of using the compositions which are the subject of this invention, the concentration level of organochlorinated compounds is reduced drastically to the same concentration as that of the surface active agent such as in the case of amine oxide, and this reduction can reach values of 0.7 ppm. In this way the sewage waters originating from the usage of these compositions are more compatible with environmental protection.

According to the invention in relation to another characteristic of the compositions, viscosity levels in the region of 700 to 800 centipoises are achieved, with chlorine concentrations lower than those of the compositions recognised by State of the Art, specifically in the region of 3 to 5% in weight terms, with a corresponding ionic strength of 1 to 2.

In addition, according to the invention the compositions are more stable in relation to hypochlorite than those State of the Art compositions and thereby the finished product is more stable and has less inherent risk of accident.

According to the invention, in whitening compositions with an alkalinic hypochlorite base, the viscosity level remains stable with the passing of time.

Another advantage of the whitening compositions, according to the invention, is that there are no hydrotopes which can be dissolved by the surface active agent used.

Another advantage of the compositions according to the invention is that there is no nitrogen in the molecular structure of th surface active agents, thereby avoiding the risk of the formation of chloramines.

All these advantages of the whitening compositions with an alkalinic hipochlorite base are achieved because these compositions contain one predominant surface active agent, of a determined nature, and at concentration levels which move between determined margins, totally eliminating the use of amine oxides.

According to the invention, the whitening composition with a alkalinic hypochlorite base, is made up of:

1) A metal alkalinic hydroxide, having a proportion of 1 to 10% in weight terms, and preferably from 2 to 6%, of the total weight.

2) One sole anionic surface active agent or, in a given case, one which has a predominant concentration level, in all cases greater than 60% of the total weight of all the surface active agents, and secondary concentration levels of other surface active agents, these being in the region of 0.1 to 10% in weight terms, preferably 0.2 to 5%, and more particularly, from 0.5 to 3% in weight, and

3) A nuetral salt which is between 0 and 4% in weight terms, preferably 0.2 to 3%, and even more desireably from 0.5 to 2.0%, of the total weight.

The preferred anionic surface active agents, without excluding other anionic surface active agents, for whitening compositions with a alkalinic hypochlorite base, according to the invention, are alkylether sulphates with alkalinic cation, which specifically have 2 to 4 units of ethylene oxide and, preferably, 2 to 3 units of ethylene oxide.

According to one preferential aspect of the invention, the alkalinic chain of the alkylether sulphate of the metal alkaline is linear and has 6 to 20, preferably 12 to 18 and, more particularly 12 to 14, carbon atoms, the alkalinic cation being selected preferably from amongst sodium, potassium and lithium.

According to another aspect of the invention, the neutral salt which forms a part of the whitening composition with an alkalinic hydroxide base is sodium chloride.

According to the invention, the compositions will preferably achieve viscosity levels of up to 800 centipoises at 20° C, measured by a brookfield viscositimeter, RVT model, with a no. 1 or no. 2 spindle at 20 r.p.m.

According to another aspect of the invention, the whitening compositions with an alkalinic hypochlorite base can contain secondary quantities of oxylenic and non-oxylenic anionic surface active agents, such as saturated fatty acid soaps, alkyl sulphates, alkyl sulphonates, sarcosinates and cumene sulphonates, xylene sulphonates, betaines, sulphosinates, alkylolinoleics and, eventually, non ionics of the oxylenic fatty alcohol or oxylenic nonyl phenol type, with a maximum number of 30 mols of etylene oxide.

In addition and according to another preferential aspect of the whitening compositions of this invention, these can contain an alkalinic metal compound, such as a caustic hydroxide like sodium hydroxide or potassium hydroxide, preferably, however, sodium hydroxide, in quantities whereby the pH value of the final composition is between 12.5 and 14 approximately.

The whitening compositions according to the invention can contain additives and auxilliary products which are usual in this type of mixture, such as perfumes, optical whiteners and colourants, in a proporation of 0.01 to 0.5% in weight terms.

The optical whitener can be of the phorwhite BHC 766 type, which is a derivate of the acid 4.4′ - bis-(1,2,3-triazolyl)-(2-)-stilbene-2,2-sulphonated, in the form of potassium salt.

According to another aspect of the invention, the whitening composition with an alkalinic hypochlorite base is prepared by mixing a solution of metal alkalinic hypochlorite with an anionic surface active agent or with a mixture of surface active agents in which the predominant part is an anionic surface active agent, preferably an alkalinic metal alkylether sulphate, with a neutral salt and, in a given case, finally the additives and auxilliary agents which are usual in this type of mixture, such as perfumes, which can be chosen from amongst a great variety of useable perfumes from monoterpenic, monocyclic and bicyclic alcohols and their esters with aklanoic acids having2 to 3 carbon atoms such as isoborneol, dihydroterpineol and isobornyl and dihydroterpinyl acetates or similar, as indicated in Spanish patent 554.709, in the name of the same applicant. In addition, optical whiteners can be added, together with perfumes and pigments such as copper phthalocyamines and ultramarine which are stable in these mixtures, and an alkalinising agent to regulate the pH value, such as sodium or potassium hydroxide, giving a final pH value of between 12.5 and 14 in the mixture.

In a given case, a low level of agitation, decantation and filtration to obtain a product which is viscous and free of foreign particules and/or any type of aglomerate.

The order in which the components are mixed is arbitrary, however, it is preferable to add the rest of

the components to the alkalinic hypochlorite solution, either separately or in any combination, by means of a low level of gradual agitation, followed by an eventual decantation process and/or filtration and final packaging.

The installation used to carry out this process according to the invention are of the usual type used for this kind of operation and the work is usually carried out at room temperature.

The invention is described below in more detail by means of using examples of preferable ways of carrying out the process, however, these are not of a restrictive nature.

EXAMPLE 1

Into a tank which can be agitated, an aqueous solution of sodium hypochloriteis placed, with an active chlorine content which varies between 3 and 7% in weight terms and a pH value of between 13.0 and 13.5, and to this solution is added an alkalinic metal alkylether sulphate, specifically Pulcra's Montosol PL 18, which is a natural alcohol with a linear chain of 12 to 14 carbon atoms in a proportion of 70:30, and an average etylene oxide content of 2.3 mols per alcohol mol, sulphated and neutralised with sodium salt, foilowed by the addition of the other components and, in a given case, decantation and filtration.

Thirteen compositions are prepared in accordance with the general formula and the components and proportions are as shown in table I below.

The indicated viscosity levels in each case would be obtained after 24 hours, and after 8 weeks of storage at room temperature.

TABLE 1

Example No.	Active Chlorine Content	% Monotosol PL18 Content (LES 100%)	Viscosity at 20° after 24 hrs.	Viscosity at 20° after 8 weeks
I-1	3.0	1.0	16	16
I-2	3.5	1.0	24	24
I-3	4.0	1.0	36	36
I-4	4.5	1.0	100	95
I-5	5.0	1.0	182	175
I-6	5.0	1.5	470	450
I-7	5.0	2.0	790	730
I-8	5.5	1.0	230	225
I-9	5.5	1.5	480	460
I-10	5.5	2.0	680	645
I-11	6.0	1.0	160	155
I-12	6.0	1.5	190	182
I-13	6.0	2.0	260	250

LES = Lauril alkalinic metal ether sulphate

* = measured in a Brookfield viscosimeter, RVT model, with spindles no. 1 or no. 2 at 20 r.p.m.

EXAMPLE II

Into a tank which can be agitated, an aqueous solution of sodium hypochlorite is placed, with an active chlorine content which varies between 3 and 7% in weight terms and a pH value of betwen 13.0 and 13.5, and to this solution is added an alkalinic metal alkylether sulphate, specifically Henkel KGna's Texopon N-70, which is a natural alcohol with a linear chain of 12 to 14 carbon atoms in a proportion of 70:30, and an average ethylene oxide content of 2.0 mols per mol of alcohol, sulphated and neutralised with a sodium salt, followed by the addition of other other components and, in a given case, decantation and filtration.

Eight compositions are prepared in accordance with the general formula and the components and proportions are as shown in table II below.

The viscosity levels indicated in each case will be obtained after 24 hours, and after 4 weeks of storage at a temperature of 40° C.

TABLE II

Example No.	Active Chlorine Content %	% Texapon N70	Viscosity at 20° C after:				
			24h	1 wk	2 wk	3 wk	4 wk
II-1	3.5	1.0	136	130	120	116	112
II-2	4.0	1.0	256	248	196	164	146
II-3	3.5	1.5	422	420	346	360	316
II-4	4.0	1.5	260	242	192	190	172
II-5	4.5	1.5	222	32	16	16	14
II-6	3.5	2.0	732	742	618	644	596
II-7	4.0	2.0	736	792	672	712	656
II-8	4.5	2.0	760	532	398	414	336
* = measured in a Brookfield viscosimeter, RVT model, with spindles no. 1 or no. 2 at 20 r.p.m.							

EXAMPLE III

Into a tank which can be agitated an aqueous solution of sodium hypochlorite is placed, with an active chlorine content which varies between 3 and 7% in weight terms, and a pH value of between 13.0 and 13.5, and to this solution is added an alkalinic metal alkylether sulphate, specifically Pulcra's Montosol PL 18, which is a natural alcohol with a linear chain of 12 and 14 carbon atoms in a proportion of 70:30 and with an average etylene oxide content of 2.3 mols per mol of alcohol, sulphated and neutralised with a sodium salt together with Niox AC-91, which is of 30% cocodimethylmine, followed by the addition of the other components and, in a given case, decantation and filtration.

Three compositions are prepared in accordance with the general formula and the components and proportions are as shown in table III below.

The viscosity levels indicated will be obtained in each case after 24 hours, and after 8 weeks of storage at room temperature.

Empl. No.	Active Chlorine Content %	% Montosol PL18 Content (LES 100%)	Niox AC91	Visc. at 20° C after 24 hrs.	Visc at 20° C after 8 weeks
III-1	3.8	0.6	0.4	193	173
III-2	3.8	0.7	0.3	233	215
III-3	3.8	0.8	0.2	194	181
* = Measured in a Brookfield viscosimeter, RVT model, with spindles no. 1 and no. 2 at 20 r.p.m.					

Claims

1) Whitening composition with a alkalinic hypochlorite base, distinguished by the fact that it is made up of a solution of metal alkalinic hypochlorite in a concentration of 1 to 10% in weight terms of the total weight; an anionic surface active agent or a mixture of surface active agents in which the predominant proportion consists of an anionic surface active agent, of the alkalinic metal aklylether sulphate type, with a concentration of between 0.1 and 10% in weight terms of the total weight; a neutral salt in a proportion of 0 to 4% in weight terms of the total weight; and up to 0.5% in weight terms of the total weight of additives and auxilliary products such as perfumes, optical whiteners, colourants and pigments.

2) Whitening composition as in claim 1, distinguished by the fact that the preferable proportion of metal alkalinic hypochlorite solution and the anionic surface active agent (or mixture of surface active agents predominantly consisting of the anionic surface active agent) which has a concentration of 0.5 to 3.0% in weight terms of the total weight, is 2 to 6% in weight terms.

3) Composition as in claims 1 and 2, distinguished by the fact that the surface active agent mixture consists of the anionic surface active agent being of 60 to 100% in weight terms and, preferably, 90 to 100% in weight terms.

4) Whitening composition as in claims 1 to 3, distinguished by the fact that the alkalinic metal alkylether sulphate can be chosen from those having 6 to 20 carbon atoms, preferably 12 to 18 and more particularly,12 to 14 carbon atoms, the preferable alkalinic metal being either sodium, potassium or lithium.

5) Whitening composition as in claims 1 to 4, distinguished by the fact that the metal alkalinic alkylether sulphate has an ethoxylation grade of between 2 and 4 mols, and preferably between 2 and 3 mols ot etylene oxide per mol.

6) Whitening composition as in claim 1 to 3, distinguished by the fact that the surface active agents, which are present in secondary quantities in the surface active agent mixture, are chosen from oxylenic and non oxylenic anionic surface active agents, as well as saturated fatty acid soaps, alkyl sulphates, alkyl sulphonates, sarcosinates and cumene sulphonates, xylene sulphonates, betaines, sulphosuccinates, alkyiolinoleics and, eventually, non ionics of the oxylenic fatty alcohol and oxylenic nonyl phenol types, with a maximum number of 30 mols of etylene oxide.

7) Whitening composition as in claim 6, distinguished by the fact that the surface active agents which are present in secondary quantities in the surface active agent mixtures, are chosen , preferably, from between xylene sulphonates, betaines, sarcosinates, alkyl sulphates, alkylolinoleics and non ionic surface active agents.

8) Whitening composition as in claims 1 to 7, distinguished by the fact that it has a strong ionic strength of between 1 and 5 and a pH value of between 12.5 and 14.

9) Whitening composition as in claims 1 to 8, distinguished by the fact that it contains an optical whitener derived from the acid 4.4′-bis-(1,2,3-triazolyl)-(2)-stilbene-2,2-sulphated, in the form of potassium salt.

10) Whitening composition as in claims 1 to 9, distinguished by the fact that it contains a perfume, chosen, amongst other, from monoterpenic, monocyclic and bicyclic alcohols and their esthers with alkanoic acids having 2 to 3 carbon atoms, such as isoborneol, dihydroterpineol and isobornyl and dihydroterpinyl acetates and similar.

11) Process for the obtention of a whitening composition as in claims 1 to 9, distinguished by the fact that it consists of a mixture, in a given case formed by agitation, of a solution of metal alkalinc hypochlorite with an anionic surface active agent or with a mixture of surface active agents in which the predominantt proportion is made up by an anionic surface active agent, preferably an alkalinic metal alkylether sulphate, with a neutral salt and, in a given final case, additives and auxilliary agents for this type of mixture, such as perfumes, optical whiteners and colourants which are stable in such mixtures and, in a given case, the pH value of the mixture formed in this way is adjusted up to a value of between 12.5 and 14 by means of adding an alkalinising agent such as sodium or potassium hydroxide, followed, in a given case, by decantation and/or filtration and final packaging.