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(54) **Title:** BIOCIDAL CLEANING COMPOSITIONS

(57) **Abstract:** The disclosed invention relate to a cleaning composition comprising 0,01 % 60 % based on weight of an alkyl polyglucoside or glycolether and 1 % - 25 based on weight of a polymeric guanidine compound. Further the invention discloses a method for manufacturing of such compositions as well as wet wiping products impregnated with such compositions.

BIOCIDAL CLEANING COMPOSITIONS

FIELD OF THE INVENTION

The present invention relates to antimicrobial compositions in particular to aqueous liquid compositions for treating a surface. The compositions according to the invention comprise a cationic polymeric biocide and a cationic or non-ionic surfactant. The compositions according to the present are particularly suited as cleaning and disinfecting compositions.

The present invention further relate to a method of manufacture of antimicrobial cleaning compositions.

The present invention further relate to disposable wiping products pre-wetted by the compositions according to the invention.

The invention further relates to the use of the compositions and the pre-wetted wiping products in cleaning and disinfecting hard surfaces, especially surfaces heavily contaminated with microorganisms.

BACKGROUND OF THE INVENTION

Liquid compositions for treating hard surfaces, such as kitchen and bathroom surfaces, surfaces of furniture or floor surfaces are well-known in the art. Such compositions usually comprise a surfactant and may further comprise biocidal compounds for disinfecting the treated surface. However, several problems exist with the known disinfection and cleaning compositions. In many cleaning applications a high amount of biocidal agent is needed. This is especially true in cases of cleaning of hospitals and elderly homes, laboratories as well as sanitary facilities. The biocidal compounds used are often to a varying degree toxic to the person using the composition. High levels of biocides are therefore especially problematic for professional cleaning personnel who regularly get into contact with cleaning compositions. The legislation of several countries there-

fore forbids the professional personnel from using cleaning compositions comprising some of these well-known biocidal compounds. Further, several microorganisms have developed resistance towards a growing number of biocidal compounds. As a consequence sufficient disinfectant properties of conventional cleaning compositions are declining. As such resistance may be particularly problematic for elderly or sick people, the ubiquitous need for improved disinfection properties of cleaning compositions for use in e.g. hospitals and elderly homes is self-evident.

Some of the problems concerning resistance have been addressed by the development of cationic polymer biocides, such as e.g. polymeric biguanide compounds, which have been proposed to be used in cleaning compositions. WO04067693A disclose a cleaning composition as well as disposable cleaning wipes which may comprise a polymeric biguanide compound and may further comprise C3-C6 glycol ethers, at levels of from about 0,25 % to about 5 %.

A novel type of biocidal polymers based on guanidinium salts has recently been discovered and disclosed in US 2003/0113291. These polymers have biocidal activity, but further show reduced toxicity towards higher organisms.

However, actual formulation of high levels of cationic polymer biocides, especially biocidal polymers based on guanidine, together with non-ionic surfactants has proven technically challenging due to extensive flocculation of the cationic biocidal polymers in the resultant compositions. As such flocculation will render the compositions highly ineffective both as regards cleaning ability and disinfection ability a need in the art exists for improved cleaning compositions having high levels of biocidal activity towards microorganisms, which compositions provide stable and long lasting disinfection while having low toxicity towards higher organisms, such as mammals.

It is thus an object of the present invention to provide new antimicrobial cleaning compositions which have a reduced toxicity towards humans.

It is further an object of the invention to provide new antimicrobial cleaning compositions which, even when manufactured in a concentrated form, have a reduced tendency to flocculate.

It is further an object of the invention to provide new antimicrobial cleaning compositions which provide a long lasting effect on surfaces.

It is further an object of the invention to provide new antimicrobial cleaning compositions which have an improved effectivity towards microorganisms, especially multiresistant microorganisms.

It is further an object of the invention to provide new antimicrobial cleaning compositions which have an improved effectivity towards microorganisms, especially viral microorganisms.

It is further an object of the invention to provide methods for producing the new antimicrobial cleaning compositions which avoids the problem of flocculation.

DEFINITIONS

By "biocide" or "antimicrobial" is meant a material or compound that is capable of killing or attenuating microorganisms such as bacteria, fungi, virus, algae, protozoa.

By "cleaning composition" is meant compositions readily suitable for cleaning of hard surfaces. "Cleaning compositions" according to the invention may however be formulated as concentrates suitable for further dilution with water according to the application and the cleaning and disinfection strength required.

By "wiping product" is meant any material used to clean surfaces. A wiping product, as defined herein, should accordingly be taken as meaning any conventional cleaning aid such as wipes, sponges, cloths, cellulose strings or strips, paper or commercially available paper towel, as well as novel wiping

products including floor wipe laminates and absorbent disposable cleaning pads.

"Disposable wet wiping product" is to be understood as a moist ready-to-use wiping product which is suitable for one time use only, while being suitable for disposal as regular garbage. Such products are usually made from nonwoven materials from cellulose fibers, viscose, polyesters and the like.

By "antimicrobial cationic polymer" is meant any cationic organic polymer that has biocidal effect towards microorganisms with a long lasting effect.

By "cationic polymer detergent material" is meant any cationic organic polymer that has properties as a detergent or surfactant.

By "non-ionic polymer detergent material" is meant any non-ionic organic polymer that has properties as a detergent or surfactant.

By "surfactant" or "detergent" is meant a material having an effect of lowering the surface tension of water. Surfactants are compounds that facilitate the solubilisation of fat and other non-polar compounds or particles in water.

SUMMARY OF THE INVENTION

It has now been shown that the novel combination of the polymeric cationic or nonionic surfactants and polymeric guanidine compounds according to the invention has several surprising properties. When applied to hard surfaces the compositions according to the invention show superior cleaning and disinfecting properties by destroying biofilms, killing microbes and leaving behind a thin layer of disinfectant material providing a sustained disinfection of the surface.

Surprisingly it has now proven possible to manufacture a cleaning composition comprising 0,01 % – 60 % based on weight of a cationic or non-ionic surfactant and 1 % – 25 % based on weight of a polymeric guanidine compound. In dilute

form the cleaning composition comprising 0,01 % – 2 % based on weight of a cationic or non-ionic surfactant and 1 % – 4 % based on weight of a polymeric guanidine compound. The present invention accordingly relates to such compositions which simultaneously deliver excellent cleaning properties on a variety of hard surfaces and high biocidal effectiveness against microbial organisms such as bacterial, fungal, protozoan and viral organisms.

The antimicrobial cationic polymer is selected among the group comprising polymeric guanidine compounds, and even more preferably a polymeric guanidine compound comprising a guanidine (or guanidinium) salt.

Due to the superior disinfectant properties of polymers comprising guanide salts (which may also be referred to as guanidinium salts), and especially the compounds poly-oxymethylene-guanidine hydrochloride (poly-2-(2-ethoxy-ethoxyethyl)-guanidinium-chloride) or poly- hexamethylene-guanidine hydrochloride, both biocidal polymers are especially suited as biocidal agent for application according to the present invention.

The preferred surfactants used in the compositions according to the invention are water-miscible glycols, preferably glycol ethers. Most preferred non-ionic surfactants are butylglycol or butyldiglycol. Due to their non-ionic nature these surfactants provide superior cleaning abilities of the compositions according to the invention. These non-ionic surfactants are suitably used in an amount of 0,01 % – 20 % based on weight of the total composition, preferably 0,01 % – 5 % based on weight of the total composition.

The composition according to the invention may alternatively or further comprise 0,01 % – 10 % based on weight of a cationic surfactant. This provides a better cleaning ability of the compositions. Without wish to be bound by theory it is further believed that higher stability of the compositions may be achieved by further using a cationic surfactant in the compositions according to the invention.

Water-miscible glycosides are preferred cationic surfactants, and alkylpolyglucoside is especially preferred.

It has further been demonstrated to be possible to produce disposable wet wiping products impregnated with a liquid composition according to the invention. These wiping products surprisingly retain the biocidal activity during storage.

DETAILED DESCRIPTION OF THE INVENTION

The composition according to the present invention is formulated as an aqueous composition. Those skilled in the art will recognize that the aqueous compositions of the present invention can be made in the form of concentrates, if desired, and then diluted prior to use. This is expected to be particularly relevant when the aqueous composition is sold as a liquid intended to be diluted in a bucket or other receptacle. The making of concentrated solutions can also be beneficial if the aqueous composition must be transported.

The compositions according to the invention may thus be concentrated cleaning compositions intended for dilution with water prior to use. Such concentrated compositions according to the invention comprise 0,01 % – 20 % based on weight of a cationic or non-ionic surfactant and 1 % – 25 % based on weight of an antimicrobial polymeric guanidine compound.

Prior to use these compositions are preferably diluted with water and may preferable after dilution comprise 0,001 % – 5 %, preferably 0,001 % – 4 % based on weight of a cationic or non-ionic surfactant and 0,1 % – 10 %, preferably 0,1 % – 4 % based on weight of an antimicrobial polymeric guanidine compound.

The compositions according to the invention include a polymeric guanidine compound, which, in the presence of the surfactant, acts as an antimicrobial compound. The effect of this combination of cationic or non-ionic surfactant and cationic polymer biocide has surprisingly been shown to be more effective in cleaning and disinfecting surfaces than would be expected by a simple additive

effect. The observed effect is believed to be due to the simultaneous and combined functionalities of the present compounds, where the surfactant removes or "lifts" the dirt particles and biofilms from the treated surface, while the cationic polymeric guanidine biocide replaces the biofilms as a thin film, providing both instant and long lasting disinfection.

The antimicrobial polymers according to the present invention are polymers comprising guanidine compounds and preferably guanidine or guanidinium salts. Such polymers are described e.g. in WO0185676A. Preferred polymers of guanidine salts are poly(oxymethylene-guanidine hydrochloride) or poly-hexamethylene-guanidine hydrochloride.

Both poly(oxymethylene-guanidine hydrochloride and poly-hexamethylene-guanidine hydrochloride are preferred polymeric antimicrobial for the compositions of this invention.

Though polymers comprising guanidine compounds, and especially poly(oxymethylene-guanidine hydrochloride) and poly-hexamethylene-guanidine hydrochloride, have been viewed as especially difficult to formulate in high concentrations in cleaning compositions comprising surfactants, these biocidal polymers are desirable in cleaning compositions due to the exceptional and long lasting antimicrobial properties of these compounds. During the course of the experiments leading to the present invention it has been shown that the compositions and the wipes impregnated with the compositions comprising poly(oxymethylene-guanidine hydrochloride) or poly-hexamethylene-guanidine hydrochloride are highly active against bacteria (including *Mycobacterium* spp. and *L. pneumophila and MRSA*), spores and fungi, without being affected by the resistance profile of the organisms. Being essentially non-toxic to higher organisms such as humans these properties, together with a very low potential to select for resistance, make poly(oxymethylene-guanidine hydrochloride) and poly-hexamethylene-guanidine hydrochloride especially suited as biocides according to the present invention. In addition to these antibiotic functions,

poly(oxymethylene-guanidine hydrochloride) and poly-hexamethylene-guanidine hydrochloride have shown activity against viral organisms.

Typically the compositions herein may in concentrated form comprise up to about 25 %, preferably from about 1 % to about 20 %, more preferably from about 2 % to about 15 %, by weight of the total composition of the polymeric guanidine compound. In a most preferred embodiment the compositions herein may in concentrated form comprise from about 7.5 % to about 12.5 %, more preferably 10 %, by weight of the total composition of the polymeric guanidine compound.

At the actual product use levels, following recommended product dilution, if any, the compositions herein may comprise up to about 10 %, preferably from about 0,1 % to about 5 %, more preferably from about 0,1 % to about 4 %,more preferably from about 0,5 % to about 2 %, by weight of the total composition of the polymeric biocide. Those skilled in the art will appreciate that the level of polymeric antimicrobial agent is dependent on the magnitude of the antimicrobial benefits sought.

The aqueous compositions of the present invention comprise at least one cationic or non-ionic surfactant, thereby assisting the wetting and cleaning of hard surfaces. The presence of such surfactants is essential to the cleaning ability of the compositions according to the invention, and further facilitates the proper disinfection effect of the cationic polymer biocide.

In a preferred embodiment, the surfactant is a glycol ether. Butyldiglycol has proven to be suitable as a surfactant according to the invention.

Typically the compositions herein may in concentrated form comprise up to about 60 %, preferably up to about 30 %, preferably from about 0,1 % to about 10 %, more preferably from about 2 % to about 10 %, even more preferably from about 5 % to about 10 % by weight of the total composition of the surfactant.

At the actual product use levels, following recommended product dilution, if any, the compositions herein may comprise up to about 5 %, preferably from about 0,01 % to about 2.5 %, more preferably from about 0,1% to about 2 %, by weight of the total composition of the surfactant.

In one embodiment, the cleaning compositions comprise at least one cationic surfactant. Alkylpolyglucosid has proven to be suitable as a cationic surfactant according to the invention. Without wish to be bound by theory it is believed that the presence of cationic detergent assist the mixing of the detergents and the cationic biocidal polymers without extensive flocculation. Accordingly, in manufacturing of the compositions according to the present invention it is preferred to first manufacture a detergent mixture to which the cationic polymer biocide is added slowly. By this manufacturing practice flocculation is surprisingly avoided while the other way around i.e. adding the detergents to the cationic polymer biocide result in flocculation.

Said additional surfactant may be present in the compositions according to the present invention in amounts from about 0,01 % to about 20 %, more preferably from about 0,1 % to about 10 %, even more preferably from about 0,5 % to about 5 % by weight of the total composition.

In addition to the surfactants, the compositions of the present invention can incorporate additional cationic, zwitterionic or amphoteric surfactants as well as mixtures thereof.

The aqueous compositions of the present invention preferably have a pH of between 6.0 – 8.0, preferably between 6.5 and 7.5, and most preferred is a pH of 7.

It has further been shown, during the course leading to the present invention, that the compositions according to the invention may comprise an additional antimicrobial compound. It has surprisingly been found that the presence of spe-

cific additional antimicrobial compounds give rise to a synergistic effect in terms of antimicrobial efficiency. Among these additional antimicrobial compounds are the antimicrobial polymers according to the present invention i.e. the polymers comprising guanidine compounds and preferably guanidine or guanidinium salts. In other words, compositions comprising different antimicrobial polymeric guanide compounds, and especially both the guanidine salts poly(oxymethylene-guanidine hydrochloride) and poly-hexamethylene-guanidine hydrochloride, have proven to have a synergistic effect.

In another aspect of the invention compositions comprising polymers based on biguanide compounds as additional antimicrobial compounds, such as biguanidhydrochlorid based polymers and polymers based on polyhexamethylene biguanide hydrochloride (PHMB), have proven to possess synergistic effects in terms of antimicrobial efficiency.

In another aspect of the invention compositions comprising quaternary ammonium compound as additional antimicrobial compounds have proven to possess synergistic effects in terms of antimicrobial efficiency. Especially the quaternary ammonium compounds selected among the group comprising alkyl(C_{12-16})dimethylbenzylammonium chloride and chlorhexidindigluconate are preferred.

In another aspect of the invention compositions comprising hydrogenperoxide as additional antimicrobial compounds have proven to possess synergistic effects in terms of antimicrobial efficiency.

More specifically the following combinations have proven especially suited:
Oligo-(2-(2-ethoxy)ethoxyethyl guanidinium chloride (CAS Nr.374572-91-5) and poly-(hexamethylendiamine guanidinium chloride) (CAS Nr. 57028-96-3), oligo-(2-(2-ethoxy)ethoxyethyl guanidinium chloride) (CAS Nr.374572-91-5) and alkyl(C12-16)dimethylbenzylammonium chloride (CAS Nr. 68424-85-1), oligo-(2-(2-ethoxy)ethoxyethyl guanidinium chloride) CAS Nr. 374572-91-5 and chlorhexidindigluconat (CAS Nr. 18472-51-0), Poly-(hexamethylendiamine gua-

nidinium chloride) (CAS Nr. 57028-96-3) and hydrogenperoxide (CAS Nr. 7722-84-1)

The additional antimicrobial compounds may be added in concentrations of up to about 25 %, preferably from about 1 % to about 10 %, more preferably from about 2 % to about 7.5 %, by weight of the total composition of the polymeric guanidine compound. In a most preferred embodiment the compositions herein may in concentrated form comprise from about 7.5 % to about 12.5 %, more preferably 10 %, by weight of the total composition of the additional antimicrobial compound.

The amount of polymeric guanidine compound and additional antimicrobial compounds may preferably, in the case of the additional antimicrobial compound being another polymeric guanidine compound or a polymeric biguanide compound, in total not exceed more than 25 %, and preferably in total comprise from about 1 % to about 20 %, more preferably from about 2 % to about 15 %, by weight of the total composition.

The liquid compositions according to the present invention may comprise a variety of other optional ingredients depending on the technical benefit aimed for and the surface treated. Suitable optional ingredients for use herein include stabilisers, buffers, perfumes, colorants, pigments and/or dyes.

The compositions according to the present invention are manufactured by preparing a detergent composition to which the polymeric guanidine compound is added. It is essential that polymeric guanidine compound is added to the detergent mixture and not vice versa, as otherwise this result in flocculation of the polymer.

The invention thus also comprises a method of manufacturing a composition comprising 0,01 % – 60 % based on weight of a cationic or non-ionic surfactant and 1 % – 25 % based on weight of an antimicrobial cationic polymer comprising the steps of

a) preparing an aqueous solution of the cationic or non-ionic surfactant,
b) optionally adding a cationic surfactant,
c) Preparing an aqueous solution of the antimicrobial cationic polymer,
d) Gently adding the solution c) to the solution a) under agitation.

The aqueous compositions can be packaged in any container that allows proper dispensing of product. Such packages include, but are not limited to capped bottles, and spray bottles. The packages can be made of any material known in the art, such as plastic or glass.

The compositions according to the invention have proven to be very effective in both cleaning and disinfection of the hard surfaces to which the cleaning composition has been applied. The novel combination of biocidal cationic polymers and detergents according to the invention provide both instant as well as long lasting disinfection while at the same time cleaning the treated surface from fat and dirt. Without wish to be bound by theory it is believed that the compositions are superior in that they provide a solubilisation of both the fat, dirt and microorganisms present on the treated surface, due to the specific combination of non-ionic detergent and cationic biocide. Even regular biofilms containing bacteria and algae are solubilised by the compositions according to the invention. The dirt particles are thereby removed on cleaning, while the compositions leave behind a thin layer of disinfectant polymer film upon drying. The thin film provides a long term disinfecting of the treated surface.

Surprisingly the compositions according to the present invention have proven effective even towards Methicillin Resistant Staphyloccocus Aureus (MRSA). Methicillin resistant Staphyloccocus Aureus are resistant towards β-lactam antibiotics, particularly the widely used dicloxacillin. Further these strains are often resistant to other antibiotics and conventional biocides. Due to their ability to enter a dormant stage, a range of conventional disinfectants have further been shown to be ineffective towards these organisms. Dormant MRSA have been found in a range of places, even on patients in hospitals, and usually occur in regular biofilms. Accordingly MRSA is a serious problem especially in hospital

environments where it is very difficult to eradicate. Surprisingly the compositions according to the present invention have proven effective even towards Methicillin Resistant Staphyloccocus Aureus also in the dormant stage. Without wish to be bound by theory it is believed that the combination of non-ionic surfactant and polymeric biocide according to the invention act by dissolving the biofilm and replacing it with a disinfecting layer of polymer, creating a long lasting disinfectant which in turn activate and kill even these dormant microorganisms.

This is particularly the case in cleaning of hospitals or elderly homes or the like, where the presence of microorganisms, and particularly MRSA, is considered especially unwanted as such microorganisms pose an infectional treat, leading to the necessary use of high doses of antibiotics as well as disinfectants in order to achieve satisfactory cleaning and disinfection.

The cleaning compositions according to the invention have proven effective as biocidal compositions, but are at the same time practically non-toxic to higher organisms such as humans or other mammals. The compositions according to the invention are therefore especially suited for use in professional cleaning. The professional personnel who are in frequent contact with the cleaning compositions are in that way not irritated to any significant degree (e.g. skin irritation or irritation of mucous membranes is substantially avoided), which could be the case using conventional disinfectants.

In one embodiment, the aqueous compositions are impregnated into disposable wiping products. This has proven to confer several benefits for use in cleaning and disinfecting of hard surfaces, especially in environments such as hospitals and elderly homes. Disposable cloths comprising the composition according to the invention have proven particularly effective for cleaning such environments by providing instant disinfection as well as long lasting disinfection as described above. Further the use of disposable wet wiping products such as one disposable cloth in a spatially limited area, e.g. the space "occupied" by one patient in a hospital, thereby avoiding carrying the cloth from place to place has proven to

result in a reduction of the number of bacteria present, e.g. of methicilin resistant bacteria.

The wet wiping products according to the invention are preferably impregnated with the compositions described herein. The amount of active substance and especially surfactant may however preferably be significantly lower in compositions suitable for impregnation of disposable wiping products. Thus, the compositions according to the invention in this aspect may comprise up to about 10 %, preferably from about 0,1 % to about 5 %, more preferably from about 0,125 % to about 2 %, even more preferably from about 0,15 % to about 1 %, by weight of the total composition of the polymeric guanidine compound. Further, the compositions according to this aspect of the invention may comprise up to about 10 %, preferably from about 0,001 % to about 5 %, more preferably from about 0,005 % to about 2 %, even more preferably from about 0,01 % to about 1 %, by weight of the total composition of the cationic or non-ionic surfactant.

Disposable wiping products are well suited for professional cleaning purposes, e.g. due to the ease of use and further due to minimising the risk of carrying around microorganisms, thereby cross-contaminating and infecting surfaces cleaned later. The disposable wiping products according to the invention have proven especially suited for professional cleaning purposes due to a remarkable low toxicity towards the professional cleaning personnel, and further due to an exceptional long lasting antimicrobial effect. Further the effectiveness towards viral microorgansims is surprising and highly beneficial especially when applied in hospitals and elderly homes.

In a preferred embodiment, the present invention encompasses a process of cleaning and disinfecting a surface, preferably a hard surface, comprising the step of wiping said surface using an aqueous composition or a disposable wet wiping product according the present invention. In a preferred embodiment the process comprises the steps of contacting parts of said surface, more preferably dirty or contaminated parts of said surface with said aqueous composition or said disposable wet wiping product.

In one embodiment preferably suited for use in hospital environments or when cleaning elderly homes, or laboratories or the like, the invention encompasses a process of cleaning and disinfecting a surface, preferably a hard surface, comprising the step of wiping said surface using a disposable wipe comprising an aqueous composition according the present invention. In a preferred embodiment the process comprises the steps of contacting parts of said surface, more preferably dirty or contaminated parts of said surface with said wipe.

The following examples are meant to exemplify compositions used in a process according to the present invention, but are not intended to limit or otherwise define the scope of the present invention. The aqueous compositions are made by combining the listed ingredients in the listed proportions to form homogenous mixtures (solution weight % unless otherwise specified).

EXAMPLES

Example 1:

Compositions 1-6 were prepared as follows:

Composition 1 comprising 50 % butyldiglycol was prepared by mixing 100 gram butyldiglycol in 100 gram of water having a pH of about 7.6.

Composition 2 comprising 50 % butyldiglycol and 1 % alkylpolyglycosid was prepared by mixing 100 gram butyldiglycol and 2 g alkylpolyglycosid in 100 gram of water having a pH of about 7.6.

Composition 3 comprising 10 % butyldiglycol and 1 % alkylpolyglycocid was prepared by mixing 100 gram butyldiglycol and 10 g alkylpolyglycosid in 900 gram of water having a pH of about 7.6.

Compositions according to the invention were prepared by slow addition of 250 g of a) a 40 % aqueous solution of poly-[2-(2-ethoxy-ethoxyethyl)-guanidinium-

chloride b) a 40 % aqueous solution of poly-hexamethylene-guanidine hydrochloride to 150 g of the above prepared compositions 1, 2 and 3. These resultant concentrated compositions were subsequently diluted with water (approx. 600g) having a pH of around 8.0 up to 1 litre. The resultant 6 compositions are shown in table 1:

Table 1:

	Poly-2-(2-ethoxy-ethoxyethyl)-guanidinium-chloride	Poly-hexamethylene-guanidine	Butyldiglycol	Alkylpolyglucosid
Composition 1a	10 %	0	7.5 %	0
Composition 2a	10 %	0	7.5 %	0,15 %
Composition 3a	10 %	0	1.5 %	0,15 %
Composition 1b	0	10 %	7.5 %	0
Composition 2b	0	10 %	7.5 %	0,15 %
Composition 3b	0	10 %	1.5 %	0,15 %

Example 2:

Cloths composed of 30 % viscose and 70 % polyester nonwoven were impregnated with the compositions 1-6 and packed in 20 piece airtight plastic packaging.

Packaged cloths were used to clean hard surfaces in patient areas, in the endoscopic clinic as well as laboratory keybords at several hospitals and labs in Denmark.

Further test cleaning of surfaces contaminated with residual urin containing Multi Resistant Staphylococcus Aureus (MRSA) was performed.

The test all showed excellent results both as on the cleaning effect (with reference to Danish Standard) both on very dirty, less dirty and only dust places. The microbial disinfection effect was excellent on key bacteria like MRSA tested

Claims

1. A cleaning composition comprising 0,01 % – 60 % based on weight of a cationic or non-ionic surfactant and 1 % – 25 % based on weight of a polymeric guanidine compound.

2. Composition according to claim 1 wherein the polymeric guanidine compound comprises a guanidine or guanidinium salt.

3. Composition according to claim 2 wherein the polymeric guanidine compound is poly-2-(2-ethoxy-ethoxyethyl)-guanidinium-chloride.

4. Composition according to claim 2 wherein the polymeric guanidine compound is poly-hexamethylene-guanidine hydrochloride.

5. Composition according to any of claims 1-4 wherein the surfactant comprises a water-miscible glycol.

6. Composition according to claim 5 wherein the surfactant is a glycol ether.

7. Composition according to claim 6 wherein the surfactant is butylglycol.

8. Composition according to claim 6 wherein the surfactant is butyldiglycol.

9. Composition according to any of claims 1-8 further comprising 0,001 % – 10 % based on weight of a cationic surfactant.

10. Composition according to claim 9 wherein the cationic surfactant is a water-miscible glycosid.

11. Composition according to claim 10 wherein the cationic surfactant comprises alkylpolyglucosid.

12. Composition according to any of claims 1-11 further comprising an additional antimicrobial agent.

13. Composition according to claim 12 comprising oligo-(2-(2-ethoxy)ethoxyethyl guanidinium chloride and poly-(hexamethylendiamine guanidinium chloride.

14. Composition according to claim 12, wherein the additional antimicrobial agent is a polymeric biguanide compound.

15. Composition according to claim 12, wherein the additional antimicrobial agent is a quaternary ammonium compound.

16. Composition according to claim 15 wherein the quaternary ammonium compound is selected among the group comprising alkyl(C_{12-16})dimethylbenzylammonium chloride and chlorhexidindigluconate

17. Composition according to claim 12, wherein the additional antimicrobial agent is hydrogenperoxide.

18. A disposable wipe impregnated with a liquid composition according to any of the above claims 1-17.

19. A method of manufacturing a composition comprising 0,01 % – 60 % based on weight of a cationic or non-ionic surfactant and 1 % – 25 % based on weight of a polymeric guanidine compound comprising the steps of;

a. preparing an aqueous solution of the cationic or non-ionic surfactant,
b. optionally adding a cationic surfactant,
c. preparing a solution of the polymeric guanidine compound,
d. gently adding the solution c) to the solution a) or b) under agitation.

20. A use of a composition according to any of claims 1-17 for cleaning and disinfecting hard surfaces.

21. Use according to claim 20 wherein said cleaning and disinfecting is performed by professional cleaning personnel.

22. Use according to claim 20 or 21 where said hard surfaces are contaminated with Methicillin Resistant Staphylococcus Aureus (MRSA).

INTERNATIONAL SEARCH REPORT

International application No
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A. CLASSIFICATION OF SUBJECT MATTER
INV. C11D1/66 C11D3/48 C11D3/20 C11D3/32 C11D3/37
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According to International Patent Classification (IPC) or to both national classification and IPC

B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)
C11D A01N

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

Electronic data base consulted during the international search (name of data base and, where practical, search terms used)
EPO-Internal, WPI Data

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	DATABASE WPI Week 200216 Derwent Publications Ltd., London, GB; AN 2002-120425 XP002435104 & RU 2 173 337 C1 (DESKO STOCK CO) 10 September 2001 (2001-09-10)	1,2,9, 12,15, 16,20,21
Y	abstract	1-22
X	DATABASE WPI Week 200371 Derwent Publications Ltd., London, GB; AN 2003-754181 XP002435105 & RU 2 208 048 C2 (GVOZDAREV V G) 10 July 2003 (2003-07-10)	1,2,9, 12,15, 16,20,21
Y	abstract	1-22

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[X] Further documents are listed in the continuation of Box C.

[X] See patent family annex.

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Date of the actual completion of the international search	Date of mailing of the international search report
25 May 2007	12/06/2007

Name and mailing address of the ISA/	Authorized officer
European Patent Office, P.B. 5818 Patentlaan 2 NL – 2280 HV Rijswijk Tel. (+31-70) 340-2040, Tx. 31 651 epo nl, Fax: (+31-70) 340-3016	Pfannenstein, Heide

INTERNATIONAL SEARCH REPORT

International application No
PCT/DK2007/000118

C(Continuation). DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
Y	FEIERTAG P ET AL: "Structural characterization of biocidal oligoguanidines" MACROMOLECULAR: RAPID COMMUNICATIONS, WILEY VCH VERLAG, WEINHEIM, DE, vol. 24, no. 9, 2003, pages 567-570, XP001181420 ISSN: 1022-1336 the whole document	1-22
Y	US 2003/113291 A1 (SCHMIDT OSKAR J [AT] ET AL) 19 June 2003 (2003-06-19) cited in the application paragraph [0017]; claims; examples	1-22
Y	EP 0 439 699 A2 (DEGUSSA [DE]) 7 August 1991 (1991-08-07) page 3, line 31 - line 45; claims; examples	1-22
Y	WO 2004/067693 A (PROCTER & GAMBLE [US]) 12 August 2004 (2004-08-12) cited in the application page 10 - page 12; claims; examples	1-22
Y	US 6 762 162 B1 (VALPEY III RICHARD S [US] ET AL) 13 July 2004 (2004-07-13) column 2; claims	1-22

INTERNATIONAL SEARCH REPORT

Information on patent family members

International application No
PCT/DK2007/000118

Patent document cited in search report	Publication date	Patent family member(s)	Publication date
RU 2173337 C1		NONE	
RU 2208048 C2	10-07-2003	NONE	
US 2003113291 A1	19-06-2003	AR 028096 A1	23-04-2003
		WO 0185676 A1	15-11-2001
		AT 285395 T	15-01-2005
		AU 5802101 A	20-11-2001
		BR 0111163 A	08-04-2003
		CA 2408191 A1	15-11-2001
		CN 1438992 A	27-08-2003
		DE 50104887 D1	27-01-2005
		EA 5462 B1	24-02-2005
		EG 22904 A	30-10-2003
		EP 1280766 A1	05-02-2003
		ES 2234837 T3	01-07-2005
		HR 20020890 A2	28-02-2005
		HU 0301948 A2	29-09-2003
		JP 2003534404 T	18-11-2003
		JP 2007092087 A	12-04-2007
		MX PA02011111 A	09-06-2003
		NZ 522871 A	29-09-2006
		PL 358892 A1	23-08-2004
		PT 1280766 T	31-05-2005
		YU 83702 A	17-08-2006
EP 0439699 A2	07-08-1991	DE 4002404 A1	01-08-1991
WO 2004067693 A	12-08-2004	NONE	
US 6762162 B1	13-07-2004	NONE	