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(54) **USE OF NON-IONIC SURFACTANT TO MINIMIZE ADVERSE EFFECTS UPON ACCIDENTAL EXPOSURE TO DETERGENT COMPOSITIONS**

(57) The use of a non-ionic surfactant in a detergent composition to provide cleaning benefits and to minimize potential adverse effects associated with accidental exposure to said detergent composition.

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Description

FIELD OF THE INVENTION

[0001] The present invention relates to the use of a non-ionic surfactant in a detergent composition to provide cleaning benefits and to minimize potential adverse effects associated with accidental exposure to said detergent composition.

BACKGROUND OF THE INVENTION

[0002] All detergent compositions have to meet stringent regulatory requirements and industry standards in order to be placed on the market. However, detergent products, due to their primary function of cleaning, all have intrinsic hazards and are labeled as such. On rare occasions accidental misuse may occur resulting in the potential for consumers to be exposed to their contents. Given the nature of the cleaning compositions, in a minority of instances adverse effects may be associated with these exposures including, but not limited to, eye irritation, emesis, narcosis or a mixture thereof. While such detergent compositions meet existing safety standards and regulatory expectation, there is a desire within the industry to further reduce the severity or potential of adverse effects associated with these rare accidental exposures, whilst still providing cleaning performance and other benefits.

[0003] It is known from the prior art, e.g. WO2016155993, that addition of soil release polymers can reduce the irritation of liquid laundry compositions. However, this approach requires addition of materials. Die to the trend of detergent composition 'compaction' for environmental and other reasons there is often limited space for the addition of further ingredients or increasing the overall levels of ingredients.

[0004] Therefore, there is a need to provide alternative means to minimize the adverse effects of rare accidental exposure of the detergent composition, including reducing the eye irritation, emesis profile, narcosis profile or a mixture thereof whilst still providing laundry cleaning benefits, especially greasy food stain cleaning, whiteness and freshness benefits. It is especially preferred to find ways to reduce the adverse effect from rare accidental exposure to the contents without the addition of further ingredients.

[0005] It was surprisingly found that the use of particular non-ionic surfactants in detergent compositions provided a desired reduction in adverse effects from rare accidental exposures whilst providing laundry cleaning, especially greasy food stain cleaning, and freshness benefits and still maintaining a good whiteness profile.

SUMMARY OF THE INVENTION

[0006] The present invention discloses the use of a non-ionic surfactant in a detergent composition to provide cleaning benefits and to minimize potential adverse effects associated with accidental exposure to said laundry detergent composition,
wherein the non-ionic surfactant is selected from a C_{8-18} linear or branched, primary or secondary alcohol ethoxylate with an average degree of ethoxylation from 10 to 50, a C_{6-22} alkyl phenol-ethoxylate with an average degree of ethoxylation between 5 and 25, or a mixture thereof.

DETAILED DESCRIPTION OF THE INVENTION

Use

[0007] The present invention is to the use of a non-ionic surfactant in a detergent composition to provide cleaning benefits and to minimize potential adverse effects associated with accidental exposure to said laundry detergent composition.

[0008] The laundry detergent composition and the non-ionic surfactant are described in more detail below.

[0009] The laundry detergent composition can be a liquid, a powder, comprising within a water-soluble unit dose article or a mixture thereof.

[0010] By 'accidental exposure' we herein mean unintentional exposure, for example from premature rupture of the unit dose article, or accidental spillage of a liquid or powder. Such accidental exposure is rare, but given the nature of the cleaning compositions contained within the unit dose article, in a minority of instances adverse effects may be associated with these exposures including, but not limited to, irritation, emesis, narcosis, or a mixture thereof.

[0011] "Irritation" is herein defined as the production of changes to the body following the application of test chemical to the anterior surface of the body, which are fully reversible within 21 days of application. In particular eye irritation is defined as the production of changes in the eye following the application of test chemical to the anterior surface of the eye, which are fully reversible within 21 days of application. The term is interchangeable with "Reversible effects on the Eye" and with "UN GHS Category 2" (4), and can be assessed following the OECD Guidelines for Testing of Chemicals, Test No. 438: Isolated Chicken Eye Test Method for Identifying i) Chemicals Inducing Serious Eye Damage and ii) Chemicals Not Requiring Classification for Eye Irritation or Serious Eye Damage (Adopted version : 26 July 2013).

[0012] Preferably, the detergent composition minimizes potential adverse effects associated with accidental exposure to said detergent composition by reducing skin irritation, eye irritation or a mixture thereof, most preferably eye irritation.

[0013] "Narcosis" is herein defined as a reversible state of stupor, unconsciousness, or arrested activity, driven by a temporary depression of the
central nervous system induced by narcotics or other chemical or physical agents.

[0014] "Emesis" is herein defined as an act or instance of spontaneous vomiting as a consequence of accidental ingestion of a chemical substance, such as a detergent composition.

[0015] Preferably, the detergent composition minimizes potential adverse effects associated with accidental exposure to said detergent composition by reducing emesis, narcosis or a mixture thereof.

[0016] The potential adverse effects associated with accidental exposure to said liquid laundry detergent composition is for example when the skin, eye or mixture thereof of the user are contacted with the liquid laundry detergent composition, or (part of) the liquid laundry detergent composition is accidently swallowed.

Detergent composition

[0017] Preferably, the detergent composition is a laundry detergent, an automatic dishwashing detergent, a hard surface cleaner, or a mixture thereof, preferably a laundry detergent composition, more preferably a water soluble unit dose article comprising a liquid laundry detergent enclosed in a water soluble film.

[0018] The use according to any preceding claims wherein the detergent composition is a liquid, a solid, comprised within a unit dose article or a mixture thereof.

[0019] The term 'liquid detergent composition' refers to any detergent composition comprising a liquid capable of wetting and treating a surface, and includes, but is not limited to, liquids, gels, pastes, dispersions and the like. The liquid composition can include solids or gases in suitably subdivided form, but the liquid composition excludes forms which are non-fluid overall, such as tablets or granules.

[0020] The term 'solid' includes free flowing powders, compressed tablets, particles, coated particles and a mixture thereof.

[0021] A water-soluble unit dose article is described in more detail below.

[0022] The detergent composition may comprise up to 50%, preferably between 5% and 50%, more preferably between 7.5% and 45%, even more preferably between 10% and 40%, or even more preferably between 12% and 35%, most preferably between 15% and 30% or even between 15% and 25% by weight of the detergent composition of a non-soap anionic surfactant.

[0023] The non-soap anionic surfactant may comprise a sulphate or a sulphonate anionic surfactant or a mixture thereof, preferably linear alkylbenzene sulphonate, alkyl sulphate, alkoxylated alkyl sulphate or a mixture thereof, more preferably a mixture of linear alkylbenzene sulphonate and alkoxylated alkyl sulphate, wherein the ratio of linear alkylbenzene sulphonate to alkoxylated alkyl sulphate is from 1:2 to 20:1, preferably from 1.1:1 to 15:1, more preferably from 1.2:1 to 10:1, even more preferably from 1.3:1 to 5:1, most preferably from 1.4:1 to 3:1.

[0024] Preferably, the alkoxylated alkyl sulphate is an ethoxylated alkyl sulphate with an average degree of ethoxylation of between 0.5 and 7, preferably between 1 and 5, more preferably between 2 and 4, most preferably about 3. Alternatively, the non-soap surfactant comprises a mixture of one or more alkoxylated alkyl sulphates, preferably ethoxylated alkyl sulphates, and optionally an alkyl sulphate, the mixture having an average degree of ethoxylation of between 0.5 and 7, preferably between 1 and 5, more preferably between 2 and 4, most preferably about 3. The alkyl sulphate and/or alkoxylated alkyl sulphate preferably have an alkyl chain comprising on average between 8 and 18 carbon atoms, preferably between 10 and 16 carbons atoms, most preferably between 12 and 14 carbon atoms. Most preferably the alkoxylated alkyl sulphate is an ethoxylated alkyl chain comprising on average between 12 and 14 carbon atoms in its alkyl chain and has an average degree of ethoxylation of about 3. The alkyl chain of the alkoxylated alkyl sulphate surfactant may be linear or branched or a mixture thereof.

[0025] The linear alkylbenzene sulphonate may be a C_{10}-C_{16} linear alkylbenzene sulphonate or a C_{11}-C_{14} linear alkylbenzene sulphonate or a mixture thereof. Exemplary linear alkylbenzene sulphonates are C_{10}-C_{16} alkyl benzene sulfonic acids, or C_{11}-C_{14} alkyl benzene sulfonic acids. By 'linear', we herein mean the alkyl group is linear. Alkyl benzene sulfonates are well known in the art.

[0026] Preferably the detergent composition comprises between 15% and 40%, preferably between 20% and 35%, more preferably between 25% and 30% by weight of the detergent composition of non-soap surfactant.

[0027] The detergent composition may comprise less than 10%, preferably less than 8%, more preferably less than 5%, most preferably between 1% and 5% by weight of the detergent composition of fatty acid, neutralised fatty acid soap or a mixture thereof.

[0028] The neutralised fatty acid soap may be alkali metal neutralised, amine neutralised or a mixture thereof. The alkali metal may be selected from sodium, potassium, magnesium or a mixture thereof, preferably sodium. The amine is preferably an alkanolamine, preferably selected from monethanolamine, diethanolamine, triethanolamine or a mixture thereof, more preferably monoethanolamine.

[0029] The fatty acid, neutralised fatty acid soap or mixture thereof may be selected from palm kernel fatty acid, coconut fatty acid, rapeseed fatty acid, neutralized palm kernel fatty acid, neutralized coconut fatty acid, neutralized rapeseed fatty acid, or mixture thereof, preferably neutralized palm kernel fatty acid.

[0030] The liquid laundry detergent composition may comprise between 0.1% and 10%, preferably between 0.5% and 8%, more preferably between 1% and 7%, even more preferably between 2% and 6%, most preferably between 3% and 5% by weight of the liquid laundry detergent composition of a soil release polymer, wherein the soil release polymer is preferably selected from polyester terephthalates, polyethylene glycol containing soil

release polymers and a mixture thereof. An example of a preferred polyethyleneglycol containing soil release polymer comprises a polyethylene glycol graft polymer comprising a polyethylene glycol backbone (Pluriol E6000) and hydrophobic vinyl acetate side chains, comprising 40% by weight of the polymer system of a polyethylene glycol backbone polymer and 60% by weight of the polymer system of the grafted vinyl acetate side chains. Polyester terephtalate soil release polymers are commercially available from Clariant under the Texcare SRN and SRA tradenames. One particularly preferred polyester terephtalate soil release polymer is Texcare SRA300.

[0031] The detergent composition may comprise a polyethyleneimine, preferably an alkoxylated polyethyleneimine, more preferably an ethoxylated polyethyleneimine and wherein preferably the detergent composition comprises greater than 0.5%, preferably between 1% and 10%, more preferably between 2% and 7%, most preferably between 3% and 5% by weight of the detergent composition of the polyethyleneimine, preferably ethoxylated polyethyleneimine. An example of an ethoxylated polyethyleneimine includes an ethoxylated polyethyleneimine with a polyethyleneimine backbone with a molecular weight of about 600, and comprising on average about 20 ethoxy units per ethoxylation chain.

[0032] Preferably, the ratio of polyethyleneimine to soil release polymer, more preferably the ratio of ethoxylated polyethyleneimine to soil release polymer is higher than 1:1, preferably between 1.1:1 and 5:1, more preferably between 1.2:1 and 3:1, most preferably between 1.3:1 and 2:1.

[0033] The detergent composition may comprise a polysaccharide polymer, a modified polysaccharide polymer, a polysaccharide derived polymer, or a mixture thereof, preferably a cellulosic polymer, a modified cellulosic polymer or a mixture thereof, most preferably a cationically modified cellulosic polymer or a mixture thereof. Most preferably the polysaccharide polymer is a cationically modified hydroethylcellulose ("Polyquaternium 10).

[0034] Preferably, the detergent composition comprises less than 2%, preferably less than 1% by weight of the liquid laundry detergent composition of aminocarboxylate chelants, aminophosphonate chelants or a mixture thereof.

[0035] Preferably, the detergent composition has a pH from 6 to 10 preferably from 7 to 9, more preferably from 7 to 8. Preferably, laundry detergent composition comprises a pH adjusting agent selected from alkanolamines, preferably monethanolamine, diethanolamine, triethanolamine or a mixture thereof, most preferably monoethanolamine.

[0036] Preferably, the detergent composition comprises an adjunct ingredient selected from hueing dyes, polymers, builders, dye transfer inhibiting agents, dispersants, enzymes, enzyme stabilizers, catalytic materials, bleach, bleach activators, polymeric dispersing agents, anti-redeposition agents, suds suppressors, aesthetic dyes, opacifiers, perfumes, perfume delivery systems, structurants, hydrotropes, processing aids, pigments, amphoteric surfactants, cyclic diamines, zwitterionic polyamines, anti-oxidants, preservatives and mixtures thereof.

[0037] Preferably, the water-soluble unit dose article comprises 15% or less by weight of the unit dose article of water, preferably the unit dose article comprises between 0.1% and 15%, more preferably between 1% and 12.5% by weight of the unit dose article of water.

Non-ionic surfactant

[0038] When in the form of a powder, the non-ionic surfactant may be present as a particle. The particles may be made by agglomeration, spray drying, extrusion or a mixture thereof. The particles may be coated, preferably between 10% and 45% by weight of the particle is a coating. Preferably the coating comprises at least 10% by weight of the coating of a water soluble salt. More preferably the water soluble salt comprises an inorganic salt. Alternatively the nonionic surfactant may be dissolved inside a liquid detergent composition.

[0039] The nonionic surfactant is present between 1 and 30%, preferably between 2 and 25%, more preferably between 3 and 20% more preferably between 4 and 15%, most preferably between 5 and 10% by weight of the detergent composition.

[0040] The non-ionic surfactant is selected from a C_{8-18} preferably C_{10-16} more preferably C_{12-15} linear or branched, primary or secondary alcohol ethoxylate with an average degree of ethoxylation from 10 to 50, preferably from 20 to 35, a C_{6-22} preferably more C_{8-18} preferably C_{10-16} even more preferably C_{12-15} alkyl phenolethoxylate with an average degree of ethoxylation between 5 and 25, or a mixture thereof.

[0041] Preferably, the detergent composition comprises less than 5%, preferably less than 2% by weight of the detergent composition of a C_{6-18} preferably C_{8-18} more preferably C_{10-16} even more preferably C_{12-15}fatty alcohol ethoxylate having an average degree of ethoxylation of between 0.5 and 9, preferably between 1 and 9, more preferably between 5 and 9, even more preferably between 6 and 10, most preferably between 7 and 8.

Water-soluble unit dose article

[0042] The water-soluble unit dose article comprises the water-soluble film shaped such that the unit-dose article comprises at least one internal compartment surrounded by the water-soluble film. The unit dose article may comprise a first water-soluble film and a second water-soluble film sealed to one another such to define the internal compartment. The water-soluble unit dose article is constructed such that the detergent composition does not leak out of the compartment during storage. However, upon addition of the water-soluble unit dose article to

water, the water-soluble film dissolves and releases the contents of the internal compartment into the wash liquor.

[0043] The compartment should be understood as meaning a closed internal space within the unit dose article, which holds the liquid laundry detergent composition. During manufacture, a first water-soluble film may be shaped to comprise an open compartment into which the liquid laundry detergent composition is added. A second water-soluble film is then laid over the first film in such an orientation as to close the opening of the compartment. The first and second films are then sealed together along a seal region.

[0044] The water-soluble film is described in more detail below.

[0045] The unit dose article may comprise more than one compartment, even at least two compartments, or even at least three compartments. The compartments may be arranged in superposed orientation, i.e. one positioned on top of the other. In such an orientation the unit dose article will comprise three films, top, middle and bottom. Alternatively, the compartments may be positioned in a side-by-side orientation, i.e. one orientated next to the other. The compartments may even be orientated in a 'tyre and rim' arrangement, i.e. a first compartment is positioned next to a second compartment, but the first compartment at least partially surrounds the second compartment, but does not completely enclose the second compartment. Alternatively one compartment may be completely enclosed within another compartment.

[0046] Wherein the unit dose article comprises at least two compartments, one of the compartments may be smaller than the other compartment. Wherein the unit dose article comprises at least three compartments, two of the compartments may be smaller than the third compartment, and preferably the smaller compartments are superposed on the larger compartment. The superposed compartments preferably are orientated side-by-side.

[0047] In a multi-compartment orientation, the liquid laundry detergent composition according to the present invention may be comprised in at least one of the compartments. It may for example be comprised in just one compartment, or may be comprised in two compartments, or even in three compartments.

[0048] Each compartment may comprise the same or different compositions. The different compositions could all be in the same form, or they may be in different forms.

[0049] The water-soluble unit dose article may comprise at least two internal compartments, wherein the liquid laundry detergent composition is comprised in at least one of the compartments, preferably wherein the unit dose article comprises at least three compartments, wherein the detergent composition is comprised in at least one of the compartments.

[0050] Preferably, the water-soluble unit dose article comprises at least two compartments and the liquid laundry detergent composition is comprised in at least one compartment, preferably wherein the water-soluble unit dose article comprises at least two compartments of different sizes and the liquid laundry detergent composition is comprised in at least the larger compartment.

Water-soluble film

[0051] The film of the present invention is soluble or dispersible in water. The water-soluble film preferably has a thickness of from 20 to 150 micron, preferably 35 to 125 micron, even more preferably 50 to 110 micron, most preferably about 76 micron.

[0052] Preferably, the film has a water-solubility of at least 50%, preferably at least 75% or even at least 95%, as measured by the method set out here after using a glass-filter with a maximum pore size of 20 microns:

> 5 grams ± 0.1 gram of film material is added in a pre-weighed 3L beaker and 2L ± 5ml of distilled water is added. This is stirred vigorously on a magnetic stirrer, Labline model No. 1250 or equivalent and 5 cm magnetic stirrer, set at 600 rpm, for 30 minutes at 30°C. Then, the mixture is filtered through a folded qualitative sintered-glass filter with a pore size as defined above (max. 20 micron). The water is dried off from the collected filtrate by any conventional method, and the weight of the remaining material is determined (which is the dissolved or dispersed fraction). Then, the percentage solubility or dispersability can be calculated.

[0053] Preferred film materials are preferably polymeric materials. The film material can, for example, be obtained by casting, blow-moulding, extrusion or blown extrusion of the polymeric material, as known in the art.

[0054] Preferred polymers, copolymers or derivatives thereof suitable for use as pouch material are selected from polyvinyl alcohols, polyvinyl pyrrolidone, polyalkylene oxides, acrylamide, acrylic acid, cellulose, cellulose ethers, cellulose esters, cellulose amides, polyvinyl acetates, polycarboxylic acids and salts, polyaminoacids or peptides, polyamides, polyacrylamide, copolymers of maleic/acrylic acids, polysaccharides including starch and gelatine, natural gums such as xanthum and carragum. More preferred polymers are selected from polyacrylates and water-soluble acrylate copolymers, methylcellulose, carboxymethylcellulose sodium, dextrin, ethylcellulose, hydroxyethyl cellulose, hydroxypropyl methylcellulose, maltodextrin, polymethacrylates, and most preferably selected from polyvinyl alcohols, polyvinyl alcohol copolymers and hydroxypropyl methyl cellulose (HPMC), and combinations thereof. Preferably, the level of polymer in the pouch material, for example a PVA polymer, is at least 60%. The polymer can have any weight average molecular weight, preferably from about 1000 to 1,000,000, more preferably from about 10,000 to 300,000 yet more preferably from about 20,000 to 150,000.

[0055] Mixtures of polymers and/or copolymers can al-

so be used as the pouch material, especially mixtures of polyvinylalcohol polymers and/or copolymers, especially mixtures of polyvinylalcohol homopolymers and/or anionic polyvinylalcohol copolymers preferably selected from sulphonated and carboxylated anionic polyvinylalcohol copolymers especially carboxylated anionic polyvinylalcohol copolymers. Most preferably the water soluble film comprises a blend of a polyvinylalcohol homopolymer and a carboxylated anionic polyvinylalcohol copolymer.

[0056] Preferred films exhibit good dissolution in cold water, meaning unheated distilled water. Preferably such films exhibit good dissolution at temperatures of 24°C, even more preferably at 10°C. By good dissolution it is meant that the film exhibits water-solubility of at least 50%, preferably at least 75% or even at least 95%, as measured by the method set out here after using a glass-filter with a maximum pore size of 20 microns, described above.

[0057] Preferred films are those supplied by Monosol under the trade references M8630, M8900, M8779, M8310.

[0058] The film may be opaque, transparent or translucent. The film may comprise a printed area.

[0059] The area of print may be achieved using standard techniques, such as flexographic printing or inkjet printing.

[0060] The film may comprise an aversive agent, for example a bittering agent. Suitable bittering agents include, but are not limited to, naringin, sucrose octaacetate, quinine hydrochloride, denatonium benzoate, or mixtures thereof. Any suitable level of aversive agent may be used in the film. Suitable levels include, but are not limited to, 1 to 5000ppm, or even 100 to 2500ppm, or even 250 to 2000rpm.

[0061] Preferably, the water-soluble unit dose article comprises a water-soluble film, preferably wherein the water-soluble film comprises polyvinyl alcohol, preferably wherein the water-soluble film comprises polyvinyl alcohol polymer or copolymer, preferably a blend of polyvinylalcohol polymers and/or polyvinylalcohol copolymers, more preferably selected from sulphonated and carboxylated anionic polyvinylalcohol copolymers especially carboxylated anionic polyvinylalcohol copolymers, most preferably a blend of a polyvinylalcohol homopolymer and a carboxylated anionic polyvinylalcohol copolymer.

Process of making

[0062] Those skilled in the art will know how to make the unit dose article and detergent compositions of the present invention using known techniques in the art.

[0063] The dimensions and values disclosed herein are not to be understood as being strictly limited to the exact numerical values recited. Instead, unless otherwise specified, each such dimension is intended to mean both the recited value and a functionally equivalent range surrounding that value. For example, a dimension disclosed as "40 mm" is intended to mean "about 40 mm."

Claims

1. The use of a non-ionic surfactant in a detergent composition to provide cleaning benefits and to minimize potential adverse effects associated with accidental exposure to said laundry detergent composition, wherein the non-ionic surfactant is selected from a C_{8-18} linear or branched, primary or secondary alcohol ethoxylate with an average degree of ethoxylation from 10 to 50, a C_{6-22} alkyl phenol-ethoxylate with an average degree of ethoxylation between 5 and 25, or a mixture thereof.

2. The use according to claim 1 wherein the detergent composition is a laundry detergent, an automatic dishwashing detergent, a hard surface cleaner, or a mixture thereof, preferably a laundry detergent composition.

3. The use according to any preceding claims wherein minimising adverse effects are selected from reducing skin irritation, reducing eye irritation, reducing emesis, reducing narcosis or a mixture thereof.

4. The use according to any preceding claims wherein the detergent composition is a liquid, a solid, comprised within a unit dose article or a mixture thereof.

5. The use according to any preceding claims wherein the detergent composition comprises less than 5%, preferably less than 2% by weight of the detergent composition of a C_{6-18} fatty alcohol ethoxylate having an average degree of ethoxylation of between 0.5 and 9.

6. The use according to any preceding claims wherein the detergent composition comprises up to 50%, preferably between 5% and 50%, more preferably between 7.5% and 45%, even more preferably between 10% and 40%, or even more preferably between 12% and 35%, most preferably between 15% and 30% or even between 15% and 25% by weight of the liquid laundry detergent composition of a non-soap anionic surfactant.

7. The use according to claim 6 wherein the non-soap anionic surfactant comprises linear alkylbenzene sulphonate, alkoxylated alkyl sulphate or a mixture thereof, more preferably a mixture thereof wherein the ratio of linear alkylbenzene sulphonate to alkoxylated alkyl sulphate preferably the ratio of linear alkylbenzene sulphonate to ethoxylated alkyl sulphate is from 1:2 to 20:1, preferably from 1.1:1 to 15:1, more preferably from 1.2:1 to 10:1, even more

preferably from 1.3:1 to 5:1, most preferably from 1.4:1 to 3:1.

8. The use according to any preceding claims wherein the detergent composition comprises less than 10%, preferably less than 8%, more preferably less than 5%, most preferably between 1% and 5% by weight of the liquid laundry detergent composition of fatty acid, neutralised fatty acid soap or a mixture thereof.

9. The use according to any preceding claims wherein the detergent composition comprise between 0.1% and 10%, preferably between 0.5% and 8%, more preferably between 1% and 7%, even more preferably between 2% and 6%, most preferably between 3% and 5% by weight of the liquid laundry detergent composition of a soil release polymer, wherein the soil release polymer is preferably selected from polyester terephthalates, polyethylene glycol containing soil release polymers and a mixture thereof.

10. The use according to any preceding claims wherein the detergent composition comprises a polyethyleneimine, preferably an ethoxylated polyethyleneimine and wherein preferably the liquid laundry detergent composition comprises greater than 0.5%, preferably between 1% and 10%, more preferably between 2% and 7%, most preferably between 3% and 5% by weight of the liquid laundry detergent composition of the polyethyleneimine, preferably ethoxylated polyethyleneimine.

11. The use according to any of claims 10-11 wherein the ratio of polyethyleneimine to soil release polymer, preferably the ratio of ethoxylated polyethyleneimine to soil release polymer is higher than 1:1, preferably between 1.1:1 and 5:1, more preferably between 1.2:1 and 3:1, most preferably between 1.3:1 and 2:1.

12. The use according to any preceding claims wherein the detergent composition comprises a polysaccharide polymer, a modified polysaccharide polymer, a polysaccharide derived polymer, or a mixture thereof, preferably a cellulosic polymer, a modified cellulosic polymer or a mixture thereof, most preferably a cationically modified cellulosic polymer or a mixture thereof.

13. The use according to any preceding claims wherein the detergent composition comprises an adjunct ingredient selected from hueing dyes, polymers, builders, dye transfer inhibiting agents, dispersants, enzymes, enzyme stabilizers, catalytic materials, bleach, bleach activators, polymeric dispersing agents, anti-redeposition agents, suds suppressors, aesthetic dyes, opacifiers, perfumes, perfume delivery systems, structurants, hydrotropes, processing aids, pigments, amphoteric surfactants, cyclic diamines, zwitterionic polyamines, anti-oxidants, preservatives and mixtures thereof.

14. The use according to any preceding claims wherein the water-soluble unit dose article comprises 15% or less by weight of the unit dose article of water, preferably the unit dose article comprises between 0.1% and 15%, more preferably between 1% and 12.5% by weight of the unit dose article of water.

15. The use according to any preceding claims wherein the potential adverse effects are minimised for when the skin, eye or mixture thereof of the user is contacted with the detergent composition, or the detergent composition is ingested.

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EUROPEAN SEARCH REPORT

Application Number
EP 18 15 7950

DOCUMENTS CONSIDERED TO BE RELEVANT

Category	Citation of document with indication, where appropriate, of relevant passages	Relevant to claim	CLASSIFICATION OF THE APPLICATION (IPC)
X	"POLY(OXYERHYLENE) NONYLPHENYL ETHER", Chemicals Evaluation Research Institute (CERI), Japan , 1 May 2007 (2007-05-01), pages 30-30, XP002779907, Retrieved from the Internet: URL:www.cerij.or.jp/ceri_en/hazard_assessment_report/pdf/en_9016_45_9.pdf [retrieved on 2018-04-10] * 7.3.2 the top; page 30 * ----- -/--	1-15	INV. C11D1/72 C11D1/825
			TECHNICAL FIELDS SEARCHED (IPC) C11D

The present search report has been drawn up for all claims

Place of search	Date of completion of the search	Examiner
Munich	11 April 2018	Culmann, J

CATEGORY OF CITED DOCUMENTS

X : particularly relevant if taken alone
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EUROPEAN SEARCH REPORT

Application Number
EP 18 15 7950

DOCUMENTS CONSIDERED TO BE RELEVANT

Category	Citation of document with indication, where appropriate, of relevant passages	Relevant to claim	CLASSIFICATION OF THE APPLICATION (IPC)
X	LÉMERY EMMANUELLE ET AL: "Skin toxicity of surfactants: Structure/toxicity relationships", COLLOIDS AND SURFACES A: PHYSIOCHEMICAL AND ENGINEERING ASPECTS, ELSEVIER, AMSTERDAM, NL, vol. 469, 20 January 2015 (2015-01-20), pages 166-179, XP029142039, ISSN: 0927-7757, DOI: 10.1016/J.COLSURFA.2015.01.019 * the left-hand column, in the middle; page 167 * * page 176, paragraph 4.4 * * tables 2,4 * * figure 5 * * the penultimate sentence; page 171, paragraph 3.4 * * the right-hand column, the first full paragraph; page 172 * * the left-hand column, the beginning of the ultimate paragraph; page 175 * * the right-hand column, the ultimate sentence; page 177 * -----	1-15	
A	PAYE M ET AL: "Antagonisms between Surfactants: The Case of Laundry Detergents", TENSIDE SURFACTANTS DETERGENTS,, vol. 46, no. 6, 1 December 2006 (2006-12-01), pages 290-294, XP002779790, DOI: 10.3139/113.100316 * the whole document * -----	1	TECHNICAL FIELDS SEARCHED (IPC)

The present search report has been drawn up for all claims

Place of search	Date of completion of the search	Examiner
Munich	11 April 2018	Culmann, J

CATEGORY OF CITED DOCUMENTS

X : particularly relevant if taken alone
Y : particularly relevant if combined with another document of the same category
A : technological background
O : non-written disclosure
P : intermediate document

T : theory or principle underlying the invention
E : earlier patent document, but published on, or after the filing date
D : document cited in the application
L : document cited for other reasons

& : member of the same patent family, corresponding document

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Patent documents cited in the description

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