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(54) **LAUNDRY TREATMENT COMPOSITION**

(57) The present invention relates to a laundry treatment composition comprising 1,2-benzisothiazol-3(2*H*)-one, methods of making said compositions, methods of using said composition and use of 1,2-benzisothiazol-3(2*H*)-one.

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Description

FIELD OF THE INVENTION

[0001] The present invention relates to a laundry treatment composition comprising 1,2-benzisothiazol-3(2*H*)-one, methods of making said compositions, methods of using said composition and use of 1,2-benzisothiazol-3(2*H*)-one.

BACKGROUND OF THE INVENTION

[0002] Laundry treatment compositions are known and used by consumers. Such treatment compositions can impart a number of different benefits to fabrics, including, but not limited to freshness, malodour control, cleaning and softening.

[0003] During manufacture, transport and storage, it is preferably to minimise unwanted microbial growth in such laundry treatment compositions. Therefore, there is an on-going need to identify suitable anti-microbial materials to formulate into laundry treatment compositions in order to minimise microbial growth therein. Preferably, the anti-microbial material should be physically and chemically stable in the laundry treatment composition and compatibility with other materials in laundry treatment composition. Such stability should include colour stability, odour stability and enzyme stability. Additionally, if the laundry treatment composition is comprised in a water-soluble unit dose article, the anti-microbial should have no negative impact on the water-soluble film.

[0004] It was surprisingly found that formulation of 1,2-benzisothiazol-3(2*H*)-one (BIT) into laundry treatment compositions minimised microbial growth in said compositions. In addition, it was surprisingly found that laundry compositions comprising 1,2-benzisothiazol-3(2*H*)-one and perfume are less prone to discoloration and had greater odour stability.

SUMMARY OF THE INVENTION

[0005] A first aspect of the present invention is a laundry treatment composition comprising 1,2-benzisothiazol-3(2*H*)-one.

[0006] A second aspect of the present invention is a method of making a laundry treatment composition according to the present invention wherein the method comprises;

a. a step of directly mixing 1,2-benzisothiazol-3(2*H*)-one with other ingredients commonly used in liquid treatment compositions; or

b. a step of preparing a perfume capsule premix, wherein the perfume capsule premix comprises perfume core/shell capsules, wherein the perfume core/shell capsules comprise perfume and a shell, wherein the shell is made from melamine formaldehyde, polyacrylate or a mixture thereof, and wherein the perfume capsule premix comprises between 50ppm and 100ppm, preferably between 60ppm and 80ppm of 1,2-benzisothiazol-3(2*H*)-one, and adding the perfume capsule premix to other ingredients commonly used in laundry treatment compositions so that the laundry treatment composition comprises between 0.1% and 5%, preferably between 0.2% and 2.5% by weight of the laundry treatment composition of perfume core/shell capsules; or

c. a step of preparing a structurant premix, wherein the thickener premix comprises a structurant, preferably hydrogenated castor oil, and wherein the structurant premix comprises between 80ppm and 120ppm, preferably between 90ppm and 100ppm of 1,2-benzisothiazol-3(2*H*)-one, and adding the structurant premix to other ingredients commonly used in laundry treatment compositions so that the laundry treatment composition comprises between 0.01% and 1%, preferably between 0.03% and 0.5%, more preferably between 0.05% and 0.2% of the structurant, preferably of hydrogenated castor oil; or

d. adding 1,2-benzisothiazol-3(2*H*)-one as a premix with one or more other materials typically used in the laundry treatment composition; or

e. a mixture thereof.

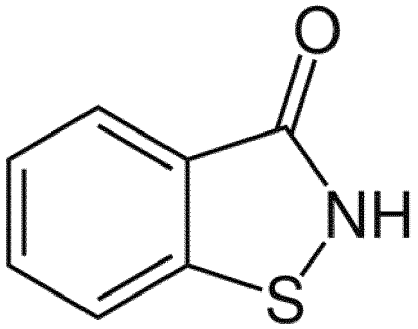
[0007] A third aspect of the present invention is a method of treating fabrics, comprising the steps of diluting the fabric treatment composition according to the present invention in water by between 100 and 3000, preferably between 100 and 800 fold to make a treatment liquor and contacting fabrics with said treatment liquor.

[0008] A fourth aspect of the present invention is the use of 1,2-benzisothiazol-3(2*H*)-one in a laundry treatment composition to reduce microbial growth in the laundry treatment composition.

DETAILED DESCRIPTION OF THE INVENTION

Laundry treatment composition

[0009] A first aspect of the present invention is a laundry treatment composition comprising 1,2-benzisothiazol-3(2*H*)-one which has the formula;



[0010] 1,2-benzisothiazol-3(2*H*)-one minimizes microbial growth of gram positive bacteria, gram negative bacteria and a mixture thereof.

[0011] By 'fabric treatment composition' we here mean any composition capable of providing a benefit to a fabric upon contact of said treatment composition with said fabric. For example, the benefit may be fabric cleaning, fabric softening, fabric conditioning or a mixture thereof. Fabric conditioning includes fabric shape retention, fabric restoration (e.g. colour restoration) or a mixture thereof.

[0012] Preferably, the fabric treatment composition is diluted in water to create a treatment liquor and the fabric is contacted with said treatment liquor. A process of treating the fabric is described in more detail below.

[0013] The laundry treatment composition may be selected from a laundry detergent composition, a laundry softening composition, a laundry perfuming composition or a mixture thereof.

[0014] Laundry detergent compositions provide cleaning benefit to fabrics. Such cleaning benefit include general soil removal, stain removal, whiteness benefit, colour restoration, dye transfer inhibition or a mixture thereof.

[0015] Laundry softening compositions provide softening benefits to fabrics. Such softening benefits include a perceived softness or silkiness feel to the fabric.

[0016] Laundry perfuming compositions provide fabric freshness benefits, fabric malodour benefits or a mixture thereof.

[0017] The laundry treatment composition may be selected from a liquid, a gel, a powder or a mixture thereof.

[0018] The laundry treatment composition preferably comprises between 0.5ppm and 200ppm, more preferably between 1ppm and 110ppm of the 1,2-benzisothiazol-3(2*H*)-one.

[0019] The laundry treatment composition may be a liquid laundry detergent composition. The liquid laundry detergent composition preferably comprises between 40% and 80%, more preferably between 50% and 75% by weight of the liquid laundry detergent composition of water. The liquid laundry detergent composition preferably comprises between 25ppm and 110ppm, more preferably between 30ppm and 105ppm of 1,2-benzisothiazol-3(2*H*)-one.

[0020] The laundry treatment composition may be a liquid fabric softening composition. The liquid fabric softening composition preferably comprises between 70% and 98%, more preferably between 75% and 95% by weight of the liquid fabric softening composition of water. Preferably, the liquid fabric softening composition comprises between 0ppm and 2ppm, more preferably between 0.001ppm and 1.75ppm, even more preferably between 0.01ppm and 1.5ppm of 1,2-benzisothiazol-3(2*H*)-one.

[0021] The laundry treatment composition may be a powder laundry detergent composition. Preferably, the powder laundry detergent composition comprises between 0ppm and 2ppm, more preferably between 0.001ppm and 1.75ppm, even more preferably between 0.01ppm and 1.5ppm of 1,2-benzisothiazol-3(2*H*)-one. The powder laundry detergent composition preferably is a granular laundry detergent composition. The granular laundry detergent composition may comprise blown powder granules, agglomerated granules, extruded granules or a mixture thereof.

[0022] The laundry treatment composition may be a compacted liquid laundry detergent composition. The compacted liquid treatment composition preferably comprises between 1% and 50%, more preferably between 1% and 40% by weight of the compacted liquid laundry detergent composition of water. Preferably, the compacted liquid laundry detergent composition comprises between 0.5ppm and 25ppm, more preferably between 0.5ppm and 20ppm, even more preferably between 0.5ppm and 15ppm of 1,2-benzisothiazol-3(2*H*)-one.

[0023] The compacted laundry treatment composition may be a high viscous liquid, such as a gel.

[0024] The compacted liquid laundry detergent composition is preferably comprised in a water-soluble unit dose article

wherein the water-soluble unit dose article comprises a water-soluble polyvinyl alcohol film, and wherein the compacted liquid laundry detergent composition comprised in the water-soluble unit dose article comprises between 1% and 25%, preferably between 2% and 13% by weight of the liquid laundry detergent composition of water.

[0025] 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 laundry treatment 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.

[0026] The compartment should be understood as meaning a closed internal space within the unit dose article, which holds the laundry treatment composition. During manufacture, a first water-soluble film may be shaped to comprise an open compartment into which the laundry treatment 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.

[0027] 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.

[0028] 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.

[0029] In a multi-compartment orientation, the laundry treatment 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.

[0030] 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.

[0031] The 1,2-benzisothiazol-3(2*H*)-one may be present in one compartment, more than one compartment or all compartments. Each compartment may comprise between 0.5ppm and 25ppm, more preferably between 0.5ppm and 20ppm, even more preferably between 0.5ppm and 15ppm of 1,2-benzisothiazol-3(2*H*)-one.

[0032] The water-soluble film is soluble 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.

[0033] 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.

[0034] 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.

[0035] 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.

[0036] Preferably, the water-soluble film comprises polyvinyl alcohol polymer or copolymer, preferably a blend of polyvinylalcohol polymers and/or polyvinylalcohol copolymers, 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.

[0037] 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.

[0038] Preferred films are those supplied by Monosol under the trade references M8630, M8900, M8779, M8310.

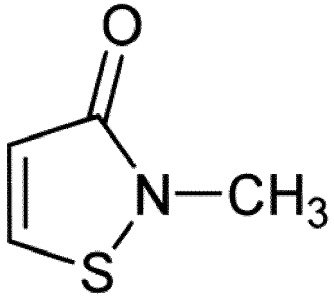
[0039] The film may be opaque, transparent or translucent. The film may comprise a printed area.

[0040] The area of print may be achieved using standard techniques, such as flexographic printing or inkjet printing.

[0041] 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.

[0042] The film may comprise 1,2-benzisothiazol-3(2*H*)-one.

[0043] Preferably, the laundry treatment composition comprises less than 15ppm of 2-Methyl-1,2-thiazol-3(2*H*)-one (MIT). Preferably the laundry treatment composition comprises no MIT. MIT has the following structure;



[0044] The laundry treatment composition preferably comprises an adjunct material. The adjunct material is preferably selected from linear alkylbenzene sulphonate, alkyl sulphate, alkoxylated alkyl sulphate, fatty alcohol alkoxylates, oxo-synthesised alcohol alkoxylate, Guerbet alcohol alkoxylates, alkyl phenol alcohol alkoxylates, amine oxide, fatty acid, neutralised fatty acid salt, citric acid, ethoxylated polyethyleneimine, zwitterionic polyamine, amphiphilic graft copolymer, polyester terephthalate, polysaccharides, cationic polysaccharides, monoethanolamine, triethanolamine, ethanol, glycerol, dipropylene glycol, 1,2-propanediol, hemicellulases, peroxidases, proteases, cellulases, xylanases, lipases, phospholipases, esterases, cutinases, pectinases, keratanases, reductases, oxidases, phenoloxidases, lipoxygenases, ligninases, pullulanases, tannases, pentosanases, malanases, β-glucanases, arabinosidases, hyaluronidase, chondroitinase, laccase, amylases, brighteners, hydrogenated castor oil, perfumes, core/shell perfume capsules, silicones, quaternary ammonium compounds, bleaches, carbonates, silicates, sulphates, polyethylene glycol, dyes, hueing dyes, as ethylenediamine-N'N'-disuccinic acid (EDDS) and/or hydroxyethane diphosphonic acid (HEDP), tetraacetylethylene diamine (TAED) and/or nonanoyloxybenzenesulphonate (NOBS), or mixture thereof.

[0045] The polysaccharide may be carboxymethylcellulose.

[0046] The cationic polysaccharide may be selected from cationically modified hydroxyethyl cellulose, cationically modified hydroxypropyl cellulose, cationically and hydrophobically modified hydroxyethyl cellulose, cationically and hydrophobically modified hydroxypropyl cellulose, or a mixture thereof, more preferably cationically modified hydroxyethyl cellulose, cationically and hydrophobically modified hydroxyethyl cellulose, or a mixture thereof.

[0047] 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.

[0048] The alkoxylated alkyl sulphate is preferably an ethoxylated alkyl sulphate, preferably with an average degree of ethoxylation between 1 and 5, preferably between 1 and 3. Preferably the alkyl chain of the alkoxylated alkyl sulphate is between 10 and 18 carbons, more preferably between 12 and 16 carbons.

[0049] Preferably the quaternary ammonium compound is selected from those having the formula;

$$[R_{(4-m)}\text{-}N^{+}\text{-}R^{1}{}_{m}]X^{-}$$

wherein each R comprises either hydrogen, a short chain C_1-C_6 alkyl, preferably a C_1-C_3 alkyl or hydroxyalkyl group, for example methyl, ethyl, propyl, hydroxyethyl, poly(C_{2-3} alkoxy), polyethoxy, benzyl, or mixtures thereof; each m is 1, 2 or 3 with the proviso that the value of each m is the same; the sum of carbons in each R^1 may be C_{12}-C_{22}, with each R^1 being a hydrocarbyl, or substituted hydrocarbyl group; and X^- may comprise any softener-compatible anion. X^- may

comprise chloride, bromide, methylsulfate, ethylsulfate, sulfate, and nitrate.

[0050] Non-limiting examples of suitable quaternary ammonium compounds include dialkylenedimethylammonium salts such as dicanoladimethylammonium chloride, di(hard)tallowdimethylammonium chloride dicanoladimethylammonium methylsulfate, and mixtures thereof. An example of commercially available dialkylenedimethylammonium salts usable in the present invention is dioleyldimethylammonium chloride available from Witco Corporation under the trade name Adogen® 472 and dihardtallow dimethylammonium chloride available from Akzo Nobel Arquad 2HT75.

[0051] The hueing dyes may comprise polymeric or non-polymeric dyes, pigments, or mixtures thereof. Preferably the hueing dye comprises a polymeric dye, comprising a chromophore constituent and a polymeric constituent. The chromophore constituent is characterized in that it absorbs light in the wavelength range of blue, red, violet, purple, or combinations thereof upon exposure to light. In one aspect, the chromophore constituent exhibits an absorbance spectrum maximum from about 520 nanometers to about 640 nanometers in water and/or methanol, and in another aspect, from about 560 nanometers to about 610 nanometers in water and/or methanol.

[0052] Although any suitable chromophore may be used, the dye chromophore is preferably selected from benzodifuranes, methine, triphenylmethanes, napthalimides, pyrazole, napthoquinone, anthraquinone, azo, oxazine, azine, xanthene, triphenodioxazine and phthalocyanine dye chromophores. Mono and di-azo dye chromophores are preferred.

[0053] The hueing dye may comprise a dye polymer comprising a chromophore covalently bound to one or more of at least three consecutive repeat units. It should be understood that the repeat units themselves do not need to comprise a chromophore. The dye polymer may comprise at least 5, or at least 10, or even at least 20 consecutive repeat units.

[0054] The repeat unit can be derived from an organic ester such as phenyl dicarboxylate in combination with an oxyalkyleneoxy and a polyoxyalkyleneoxy. Repeat units can be derived from alkenes, epoxides, aziridine, carbohydrate including the units that comprise modified celluloses such as hydroxyalkylcellulose; hydroxypropyl cellulose; hydroxypropyl methylcellulose; hydroxybutyl cellulose; and, hydroxybutyl methylcellulose or mixtures thereof. The repeat units may be derived from alkenes, or epoxides or mixtures thereof. The repeat units may be C2-C4 alkyleneoxy groups, sometimes called alkoxy groups, preferably derived from C2-C4 alkylene oxide. The repeat units may be C2-C4 alkoxy groups, preferably ethoxy groups.

[0055] For the purposes of the present invention, the at least three consecutive repeat units form a polymeric constituent. The polymeric constituent may be covalently bound to the chromophore group, directly or indirectly via a linking group. Examples of suitable polymeric constituents include polyoxyalkylene chains having multiple repeating units. In one aspect, the polymeric constituents include polyoxyalkylene chains having from 2 to about 30 repeating units, from 2 to about 20 repeating units, from 2 to about 10 repeating units or even from about 3 or 4 to about 6 repeating units. Non-limiting examples of polyoxyalkylene chains include ethylene oxide, propylene oxide, glycidol oxide, butylene oxide and mixtures thereof.

[0056] The shell of the core/shell perfume capsule may comprise polyacrylate polymer. The shell may include from about 50% to about 100%, or from about 70% to about 100%, or from about 80% to about 100% of a polyacrylate polymer. The polyacrylate may include a polyacrylate cross linked polymer.

[0057] The shell material may include a material selected from the group consisting of a polyacrylate, a polyethylene glycol acrylate, a polyurethane acrylate, an epoxy acrylate, a polymethacrylate, a polyethylene glycol methacrylate, a polyurethane methacrylate, an epoxy methacrylate, and mixtures thereof.

[0058] The shell material of the capsules may include a polymer derived from a material that comprises one or more multifunctional acrylate moieties. The multifunctional acrylate moiety may be selected from the group consisting of trifunctional acrylate, tetra- functional acrylate, penta-functional acrylate, hexa-functional acrylate, hepta-functional acrylate and mixtures thereof. The multifunctional acrylate moiety is preferably hexa-functional acrylate. The shell material may include a polyacrylate that comprises a moiety selected from the group consisting of an acrylate moiety, methacrylate moiety, amine acrylate moiety, amine methacrylate moiety, a carboxylic acid acrylate moiety, carboxylic acid methacrylate moiety and combinations thereof, preferably an amine methacrylate or carboxylic acid acrylate moiety.

[0059] The shell material may include a material that comprises one or more multifunctional acrylate and/or methacrylate moieties. The ratio of material that comprises one or more multifunctional acrylate moieties to material that comprises one or more methacrylate moieties may be from about 999:1 to about 6:4, preferably from about 99:1 to about 8:1, more preferably from about 99:1 to about 8.5:1.

[0060] The core/shell capsule may comprise an emulsifier, wherein the emulsifier is preferably selected from anionic emulsifiers, nonionic emulsifiers, cationic emulsifiers or mixtures thereof, preferably nonionic emulsifiers.

[0061] The core/shell capsule may comprise from 0.1 % to 1.1% by weight of the core/shell capsule of polyvinyl alcohol.

[0062] Polyacrylate perfume capsules can be purchased from Encapsys, (825 East Wisconsin Ave, Appleton, WI 54911), and are made as follows: a first oil phase, consisting of 37.5 g perfume, 0.2 g tert-butylamino ethyl methacrylate, and 0.2 g beta hydroxyethyl acrylate is mixed for about 1 hour before the addition of 18 g CN975 (Sartomer, Exter, PA). The solution is allowed to mix until needed later in the process.

[0063] A second oil phase consisting of 65 g of the perfume oil, 84 g isopropyl myristate, 1 g 2,2'-azobis(2-methylbutyronitrile), and 0.8 g 4,4'-azobis[4-cyanovaleric acid] is added to a jacketed steel reactor. The reactor is held at 35°C

and the oil solution in mixed at 500 rpm's with a 2" flat blade mixer. A nitrogen blanket is applied to the reactor at a rate of 300cc/min. The solution is heated to 70°C in 45 minutes and held at 70°C for 45 minutes, before cooling to 50°C in 75 minutes. At 50°C, the first oil phase is added and the combined oils are mixed for another 10 minutes at 50°C.

[0064] The shell may comprise polyurea or polyurethane and may be prepared using one or more polyisocyanates and one or more cross-linker agents.

[0065] A polyisocyanate is a molecule having two or more isocyanate groups, i.e., O=C=N-, wherein said polyisocyanate can be aromatic, aliphatic, linear, branched, or cyclic. In certain aspects, the polyisocyanate contains, on average, 2 to 4 -N=C=O groups. In particular aspects, the polyisocyanate contains at least three isocyanate functional groups. In certain aspects, the polyisocyanate is water-insoluble.

[0066] The polyisocyanate can be an aromatic or aliphatic polyisocyanate. Desirable aromatic polyisocyanates each have a phenyl, tolyl, xylyl, naphthyl or diphenyl moiety or a combination thereof as the aromatic component. The aromatic polyisocyanate may be a polymeric methylene diphenyl diisocyanate ("PMDI"), a polyisocyanurate of toluene diisocyanate, a trimethylol propane-adduct of toluene diisocyanate or a trimethylol propane-adduct of xylylene diisocyanate. Suitable aliphatic polyisocyanates include trimers of hexamethylene diisocyanate, trimers of isophorone diisocyanate or biurets of hexamethylene diisocyanate. Additional examples include those commercially available, e.g., BAYHYDUR N304 and BAYHYDUR N305, which are aliphatic water-dispersible polyisocyanates based on hexamethylene diisocyanate; DESMODUR N3600, DESMODUR N3700, and DESMODUR N3900, which are low viscosity, polyfunctional aliphatic polyisocyanates based on hexamethylene diisocyanate; and DESMODUR 3600 and DESMODUR N100 which are aliphatic polyisocyanates based on hexamethylene diisocyanate, each of which is available from Bayer Corporation (Pittsburgh, Pa.).

[0067] Specific examples of polyisocyanates include 1,5-naphthylene diisocyanate, 4,4'-diphenylmethane diisocyanate (MDI), hydrogenated MDI (H12MDI), xylylene diisocyanate (XDI), tetramethylxylol diisocyanate (TMXDI), 4,4'-diphenyldimethylmethane diisocyanate, di- and tetraalkyldiphenylmethane diisocyanate, 4,4'-dibenzyl diisocyanate, 1,3-phenylene diisocyanate, 1,4-phenylene diisocyanate, the isomers of tolylene diisocyanate (TDI), optionally in a mixture, 1-methyl-2,4-diisocyanatocyclohexane, 1,6-diisocyanato-2,2,4-trimethylhexane, 1,6-diisocyanato-2,4,4-trimethylhexane, 1-isocyanatomethyl-3-isocyanato-1 ,5,5-trimethylcyclohexane, chlorinated and brominated diisocyanates, phosphorus-containing diisocyanates, 4,4'-diisocyanatophenylperfiuoroethane, tetramethoxybutane 1,4-diisocyanate, butane 1,4-diisocyanate, hexane 1,6-diisocyanate (HDI), dicyclohexylmethane diisocyanate, cyclohexane 1,4-diisocyanate, ethylene diisocyanate, phthalic acid bisisocyanatoethyl ester, also polyisocyanates with reactive halogen atoms, such as 1-chloromethylphenyl 2,4-diisocyanate, 1-bromomethylphenyl 2,6-diisocyanate, 3,3-bischloromethyl ether 4,4'-diphenyldiisocyanate.

[0068] Other suitable commercially-available polyisocyanates include LUPRANATE M20 (PMDI, commercially available from BASF containing isocyanate group "NCO" 31.5 wt %), where the average n is 0.7; PAPI 27 (PMDI commercially available from Dow Chemical having an average molecular weight of 340 and containing NCO 31.4 wt %) where the average n is 0.7; MONDUR MR (PMDI containing NCO at 31 wt % or greater, commercially available from Bayer) where the average n is 0.8; MONDUR MR Light (PMDI containing NCO 31.8 wt %, commercially available from Bayer) where the average n is 0.8; MONDUR 489 (PMDI commercially available from Bayer containing NCO 30-31.4 wt %) where the average n is 1.0; poly [(phenylisocyanate)-co-formaldehyde] (Aldrich Chemical, Milwaukee, Wis.), other isocyanate monomers such as DESMODUR N3200 (poly(hexamethylene diisocyanate) commercially available from Bayer), and TAKENATE D110-N (xylene diisocyanate adduct polymer commercially available from Mitsui Chemicals corporation, Rye Brook, N.Y., containing NCO 11.5 wt %), DESMODUR L75 (a polyisocyanate base on toluene diisocyanate commercially available from Bayer), DESMODUR IL (another polyisocyanate based on toluene diisocyanate commercially available from Bayer), and DESMODUR RC (a polyisocyanurate of toluene diisocyanate).

[0069] The average molecular weight of certain suitable polyisocyanates varies from 250 to 1000 Da and preferable from 275 to 500 Da. In general, the range of the polyisocyanate concentration varies from 0.1% to 10%, preferably from 0.1% to 8%, more preferably from 0.2 to 5%, and even more preferably from 1.5% to 3.5%, all based on the weight of the core/shell perfume capsule.

[0070] Cross-linkers or cross-linking agents suitable for use with polyisocyanates each contain multiple (i.e., two or more) functional groups (e.g., -NH-, -NH2 and -OH) that can react with polyisocyanates to form polyureas or polyurethanes. Examples include polyfunctional amines containing two or more amine groups (e.g., polyamines), polyfunctional alcohols containing two or more hydroxyl groups (e.g., polyols), epoxy cross-linkers, acrylate crosslinkers, and hybrid cross-linking agents containing one or more amine groups and one or more hydroxyl groups. Amine groups in the cross-linking agents include -NH2and R*NH, R* being substituted and unsubstituted C_1-C_{20} alkyl, C_1-C_{20} heteroalkyl, C_1-C_{20} cycloalkyl, 3- to 8-membered heterocycloalkyl, aryl, and heteroaryl.

[0071] Two classes of such polyamines include polyalkylene polyamines. Examples of the first class of polyalkylene polyamines include ethylene diamine, 1,3-diaminepropane, diethylene triamine, triethylene tetramine, 1,4-diaminobutane, hexaethylene diamine, hexamethylene diamine, pentaethylenehexamine, melamine and the like. Exemplary amines of the second class of polyalkylene polyamines also include diethylenetriamine, bis(3-aminopropyl)amine, bis(3-

aminopropyl)-ethylenediamine, bis(hexanethylene)triamine.

[0072] Another class of amine that can be used in the invention is polyetheramines. They contain primary amino groups attached to the end of a polyether backbone. The polyether backbone is normally based on either propylene oxide (P0), ethylene oxide (EO), or mixed P0/EQ. Exemplary polyetheramines include 2,2-(ethylenedioxy)-bis (ethylamine) and 4,7,10-trioxa- 1, 13-tridecanediamine.

[0073] Other suitable amines include, but are not limited to, tris(2-aminoethyl)amine, triethylenetetramine, N,N'-bis (3-aminopropyl)- 1,3-propanediamine, tetraethylene pentamine, 1,2-diaminopropane, 1,2-diaminoethane, N,N,N',N'-tetrakis(2-hydroxyethyl) ethylene diamine, N,N,N',N'-tetrakis(2-hydroxypropyl)ethylene diamine, N,N, N',N'-tetrakis(3-aminopropyl)-1,4-butanediamine, 3,5-diamino-1,2,4-triazole, branched polyethylenimine, 2,4-diamino-6-hydroxypyrimidine and 2,4,6-triaminopyrimidine.

[0074] Branched polyethylenimines useful as cross-linking agents typically have a molecular weight of 200 to 2,000,000 Da (e.g., 800 to 2,000,000 Da, 2,000 to 1,000,000 Da, 10,000 to 200,000 Da, and 20,000 to 100,000 Da).

[0075] Amphoteric amines, i.e., amines that can react as an acid as well as a base, are another class of amines of use in this invention.

[0076] Guanidine amines and guanidine salts are yet another class of multi-functional amines of use in this invention.

[0077] Commercially available examples of amines include JEFFAMINE EDR-148 having a structure shown above (where n=2), JEFFAMINE EDR-176 (where n=3) (from Huntsman). Other polyether amines include the JEFFAMINE ED Series, JEFFAMINE TRIAMINES, polyethylenimines from BASF (Ludwigshafen, Germany) under LUPASOL grades (e.g., LUPASOL FG, LUPASOL G20 waterfree, LUPASOL PR 8515, LUPASOL WF, LUPASOL FC, LUPASOL G20, LUPASOL G35, LUPASOL G100, LUPASOL G500, LUPASOL HF, LUPASOL PS, LUPASOL HEO 1, LUPASOL PNSO, LUPASOL PN6O, LUPASOL PO100 and LUPASOL SK). Other commercially available polyethylenimines include EPOMIN P-1000, EPOMIN P-1050, EPOMIN RP18W and EPOMIN PP-061 from NIPPON SHOKUBAI (New York, N.Y). Polyvinylamines such as those sold by BASF under LUPAMINE grades can also be used. A wide range of polyetheramines may be selected by those skilled in the art. In certain embodiments, the cross-linking agent is hexamethylene diamine, polyetheramine or a mixture thereof.

The range of polyfunctional amines, polyfunctional alcohols, or hybrid cross-linking agents can vary from 0.1% to 5% (e.g., 0.2% to 3%, 0.2% to 2%, 0.5% to 2%, or 0.5% to 1%) by weight of the core/shell perfume capsule. The cross-linking agent may be added to the capsule reaction at a temperature of 0-55° C (e.g., 10-50° C, 15-45° C, 20-40° C, or 22-35° C).

[0078] The perfume composition comprised in the core comprises perfume raw materials. The encapsulated benefit agent may further comprise essential oils, malodour reducing agents, odour controlling agents, silicone, and combinations thereof.

[0079] The perfume raw materials are typically present in an amount of from 10% to 95%, preferably from 20% to 90% by weight of the capsule.

[0080] The perfume composition may comprise from 2.5% to 30%, preferably from 5% to 30% by weight of perfume composition of perfume raw materials characterized by a logP lower than 3.0, and a boiling point lower than 250°C.

[0081] The perfume composition may comprise from 5% to 30%, preferably from 7% to 25% by weight of perfume composition of perfume raw materials characterized by having a logP lower than 3.0 and a boiling point higher than 250°C. The perfume composition may comprise from 35% to 60%, preferably from 40% to 55% by weight of perfume composition of perfume raw materials characterized by having a logP higher than 3.0 and a boiling point lower than 250°C. The perfume composition may comprise from 10% to 45%, preferably from 12% to 40% by weight of perfume composition of perfume raw materials characterized by having a logP higher than 3.0 and a boiling point higher than 250°C.

[0082] Preferably, the core also comprises a partitioning modifier. Suitable partitioning modifiers include vegetable oil, modified vegetable oil, propan-2-yl tetradecanoate and mixtures thereof. The modified vegetable oil may be esterified and/or brominated. The vegetable oil comprises castor oil and/or soy bean oil. The partitioning modifier may be propan-2-yl tetradecanoate. The partitioning modifier may be present in the core at a level, based on total core weight, of greater than 20%, or from greater than 20% to about 80%, or from greater than 20% to about 70%, or from greater than 20% to about 60%, or from about 30% to about 60%, or from about 30% to about 50%.

[0083] Preferably the core/shell capsule have a volume weighted mean particle size from 0.5 microns to 100 microns, preferably from 1 micron to 60 microns, even more preferably from 5 microns to 30 microns.

Method of making the laundry treatment composition

[0084] An aspect of the present invention is a method of making a laundry treatment composition according to the present invention wherein the method comprises;

a. a step of directly mixing 1,2-benzisothiazol-3(2*H*)-one with other ingredients commonly used in liquid treatment compositions; or

b. a step of preparing a perfume capsule premix, wherein the perfume capsule premix comprises perfume core/shell capsules, wherein the perfume core/shell capsules comprise perfume and a shell, wherein the shell is made from melamine formaldehyde, polyacrylate or a mixture thereof, and wherein the perfume capsule premix comprises between 50ppm and 100ppm, preferably between 60ppm and 80ppm of 1,2-benzisothiazol-3(2*H*)-one, and adding the perfume capsule premix to other ingredients commonly used in laundry treatment compositions so that the laundry treatment composition comprises between 0.1% and 5%, preferably between 0.2% and 2.5% by weight of the laundry treatment composition of perfume core/shell capsules; or

c. a step of preparing a structurant premix, wherein the thickener premix comprises a structurant, preferably hydrogenated castor oil, and wherein the structurant premix comprises between 80ppm and 120ppm, preferably between 90ppm and 100ppm of 1,2-benzisothiazol-3(2*H*)-one, and adding the structurant premix to other ingredients commonly used in laundry treatment compositions so that the laundry treatment composition comprises between 0.01% and 1%, preferably between 0.03% and 0.5%, more preferably between 0.05% and 0.2% of the structurant, preferably of hydrogenated castor oil; or

d. adding 1,2-benzisothiazol-3(2*H*)-one as a premix with one or more other materials typically used in the laundry treatment composition; or

e. a mixture thereof.

[0085] Those skilled in the art will be aware of suitable means to mix the relevant ingredients to make a laundry treatment composition. Commonly used off the shelf mixing apparatus known to the skilled person can be used.

[0086] Preferably, the structurant premix comprises between 2% and 7% by weight of the premix of hydrogenated castor oil, between 10% and 20% by weight of the premix of hydrogenated castor oil, between 1% and 5% by weight of the premix of monoethanolamine, and the remainder being water.

[0087] Those skilled in the art will be aware of suitable methods to manufacture water-soluble unit dose articles according to the present invention. Commonly known methods include thermoforming and extrusion. Water-soluble films may be sealed together using heat, solvents or a mixture thereof.

Method of treating fabrics

[0088] An aspect of the present invention is a method of treating fabrics, comprising the steps of diluting the fabric treatment composition in water by between 100 and 3000 fold, preferably between 100 and 800 fold to make a treatment liquor and contacting fabrics with said treatment liquor.

[0089] The fabrics may be added to the treatment liquor once the treatment liquor is made. Alternatively, the treatment liquor may be made whilst the fabrics are present. For example, the treatment liquor may be made in the drum of a washing machine once the fabrics have been added to said drum.

[0090] The treatment liquor maybe made for use in a hand wash operation, in an automatic washing machine or a mixture thereof.

[0091] The treatment liquor may be a wash liquor, a rinse liquor or a mixture thereof.

Use

[0092] A further aspect of the present invention is the use of 1,2-benzisothiazol-3(2*H*)-one in a laundry treatment composition to reduce microbial growth in the laundry treatment composition. Preferably, an aspect of the present invention is the use of 1,2-benzisothiazol-3(2*H*)-one in a laundry treatment composition according to the present invention to reduce microbial growth in the laundry treatment composition. "Microbial growth" herein means growth of microorganisms. Microorganisms include fungi, bacteria or a mixture thereof. Bacteria include gram positive bacteria, gram negative bacteria or a mixture thereof.

[0093] 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."

EXAMPLES

Example 1

[0094] Liquid laundry detergent compositions according to the present invention:

	Ex. 1A	Ex. 1B	Ex. 1C	Ex. 1D
	wt%	wt%	wt%	wt%
C12-14 EO3 alkyl ethoxylated sulfate	9.8	4.0	0.6	9.0
C12-15 linear alkylbenzene sulfonic acid	14.5	9.2	5.9	12.0
C12-15 EO8 ethoxylated alcohol	2.0	4.0	3.0	0
C12-14 EO7 ethoxylated alcohol	0	0	0	6.0
Dodecydimethylamine-N-oxide	0	0.5	1.0	0
Citric Acid	4.8	2.8	1.9	3.0
C12-18 Fatty Acid	3.3	1.7	1.2	8.0
Sodium Cumene Sulfonate	0	1.7	0.2	0
Zwitterionic polyamine[1]	0.7	0	0.3	2.1
Diethylenetriamine penta(methylene phosphonic acid), Sodium salt (DTPMP)	0	0.5	0.2	0
1-hydroxyethane 1,1-diphosphonic acid (HEDP)	0.6	0	0	1.5
Mannanase[2]	0.003	0.002	0	0
Amylase[3]	0.013	0.004	0.0016	0.0032
Protease[4]	0.039	0.02	0.018	0.036
Cellulase[5]	0	0	0.006	0.012
Pectate Lyase[6]	0.005	0.002	0	0
Lipase[7]	0	0	0.010	0
PEG-PVAc Polymer[8]	1.9	1.3	0	0
Di-ethoxylated poly (1,2 propylene terephtalate) short block soil release polymer[9]	0	0	0.9	0.9
Ethoxylated Polyethylenimine[10]	0.5	0	0.9	0
Brightener 49	0.08	0	0.05	0.2
Bis azo or azo thiophene hueing dye[11]	0	0	0.02	0
Hydrogenated castor oil[12]	1	0.30	0.0	0.75
2-propylheptanol	5	0	0	0
Diethylene glycol	0	0	3	4.0
1, 2 propanediol	8.3	1.3	1.0	7.0
Ethanol	0	0	0.5	0
Glycerine	0	0.1	0	0
Sodium formate	0	0.03	0.3	0
Calcium Chloride	0.03	0.01	0.006	0
Boric acid	0	0	1.1	1.5
Monoethanolamine	8.8	0	0.35	8.5
Triethanolamine	0	0.58	0	0
Sodium hydroxide	to pH 7.4	to pH 7.9	to pH 8.0	to pH 8.0
1,2-benzisothiazol-3(2H)-one	0.003	0.001	0.001	0.003
Silicone suds suppressor	0	0.003	0.003	0.005

(continued)

	Ex. 1A	Ex. 1B	Ex. 1C	Ex. 1D
	wt%	wt%	wt%	wt%
Perfume microcapsules	0	0.25	0	0
Perfume	1.5	0.9	0.6	1.7
Dye	0.009	0.005	0.004	0.004
Water	to 100%	to 100%	to 100%	to 100%

[1] Zwitterionic ethoxylated quaternized sulfated hexamethylene diamine, supplied by BASF, Germany
[2] Mannanase enzyme originating from Bacillus sp. I633 available from Novozymes, Denmark
[3] Termamyl® Ultra, available from Novozymes, Denmark
[4] Protease enzyme from Bacillus Amyloliquefaciens as described in EP 0 130 756 B1 published January 9, 1985
[5] Carezyme® available from Novozymes, Denmark
[6] Pectawash® 20L, supplied by Novozymes, Denmark
[7] Lipex®, supplied by Novozymes, Denmark
[8] Polyvinyl acetate grafted polyethylene oxide copolymer having a polyethylene oxide backbone and multiple polyvinyl acetate side chains, supplied by BASF, Germany.
[9] TexCare® SRN-100, supplied by Clariant, Germany
[10] Polyethyleneimine (MW = 600) with 20 ethoxylate groups per -NH, supplied by BASF
[11] Supplied by Milliken, USA
[12] prepared as an aqueous premix comprising 4wt% of hydrogenated castor oil, 16 wt% of C12-15 linear alkylbenzene sulfonic acid and sufficient 1,2-benzisothiazol-3(2H)-one to preserve the composition. The levels of the ingredients in the table include the amounts of the three ingredients that are added as part of the premix.

Example 2

[0095] Liquid laundry fabric softener compositions according to the present invention: summarized in the following table.

	Wt % in the Composition									
	3A	3B	3C	3D	3E	3F	3G	3H	31	3J
FSA [a]	14	16.47	14	12	12	16.47	---	---	5	5
FSA [b]					---		3.00	---	---	---
FSA [c]					---		---	6.5	---	---
Ethanol	2.18	2.57	2.18	1.95	1.95	2.57	---	---	0.81	0.81
Isopropyl Alcohol	---	---	---	---	---	---	0.33	1.22	---	---
Starch [d]	1.25	1.47	2.00	1.25	---	2.30	0.5	0.70	0.71	0.42
Phase Stabilizing Polymer [f]	0.21	0.25	0.21	0.21	0.14	---	---	0.14	---	---
Calcium Chloride	0.15	0.176	0.15	0.15	0.30	0.176	---	0.1-0.15	---	---
DTPA [h]	0.017	0.017	0.017	0.017	0.007	0.007	0.20	---	0.002	0.002
Preservative	5	5	5	5	5	5	---	250 [j]	5	5
(ppm) [i,j]										
Antifoam[k]	0.015	0.018	0.015	0.015	0.015	0.015	---	0.1	0.015	0.015
Dye (ppm)	40	40	40	40	40	40	11	30-300	30	30
Ammonium Chloride	0.100	0.118	0.100	0.100	0.115	0.115	---	---	---	---
HCl	0.012	0.014	0.012	0.012	0.028	0.028	0.016	0.025	0.011	0.011

(continued)

	Wt % in the Composition									
	3A	3B	3C	3D	3E	3F	3G	3H	31	3J
Structurant[l]	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01
Perfume	0.8	0.7	0.9	0.5	1.2	0.5	1.1	0.6	1.0	0.9
Deionized Water	*	*	*	*	*	*	*	*	*	*

* Balance
[a] N,N-di(tallowoyloxyethyl)-N,N-dimethylammonium chloride.
[b] Methyl bis(tallow amidoethyl)2-hydroxyethyl ammonium methyl sulfate.
[c] Compound of Fatty acid with Methyldiethanolamine in a molar ratio 1.5:1, quaternized with Methylchloride, resulting in a 1:1 molar mixture of N,N-bis(stearoyl-oxy-ethyl) N,N-dimethyl ammonium chloride and N-(stearoyl-oxy-ethyl) N,-hydroxyethyl N,N dimethyl ammonium chloride.
[d] Cationic high amylose maize starch available from National Starch under the trade name CATO®.
[f] Copolymer of ethylene oxide and terephthalate.
[g] SE39 from Wacker
[h] Diethylenetriaminepentaacetic acid.
[i] KATHON® CG available from Rohm and Haas Co. "PPM" is "parts per million."
[j] Gluteraldehyde
[k] Silicone antifoam agent available from Dow Corning Corp. under the trade name DC2310.
[l] Hydrophobically-modified ethoxylated urethane available from Rohm and Haas under the tradename Aculan 44.

Example 3

[0096] A water-soluble unit dose article according to the present invention comprising an anionically charged polyvinyl alcohol film, preferably wherein the film is a blend of polyvinylalcohol polymers and/or polyvinylalcohol copolymers, 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, and a liquid laundry detergent comprising;

Ingredients	**Wt% of composition unless stated otherwise**
Linear C_9-C_{15} Alkylbenzene sulfonic acid	18-23
C12-15 ethoxylated alkyl sulphate with an average degree of ethoxylation of 3	8-16
C_{12-14} fatty alcohol ethoxylate having an average degree of ethoxylation of 7	2-5
Citric Acid	0.5-1
Fatty acid	4-7
Chelants	0.75-2.25
Cleaning polymers (selected from CMC, polyester terephthalate (preferably anionically modified), amphiphilic graft copolymer, ethoxylated polyethyleneimine or a mixture thereof)	4-9
Enzymes (selected from amylase, protease, lipase, xyloglucanase or a mixture thereof)	0.01-1
Brightener 49	0.05-1
Structurant (preferably hydrogenated castor oil)	0.05-0.5
Solvent system (selected from propanediol, glycerol, ethanol, dipropyleneglycol, tripropyleneglycol, polyetheyleneglycol, polypropyleneglycol)	15-25
Water	8-13
Perfume	0.5-2

(continued)

Ingredients	Wt% of composition unless stated otherwise
Perfume capsule	0.5-2
Aesthetic dye, opacifier or a mixture thereof	0.5-2
Mono-ethanolamine, NaOH or mixture thereof	5-15
1,2-benzisothiazol-3(2*H*)-one	0.5ppm - 25ppm
Other laundry adjuncts / minors	To 100

Example 4

[0097] A powder laundry detergent composition according to the present invention;

Component	Wt % in the Composition						
	4A	4B	4C	4D	4E	4F	9G
Brightener	0.1	0.1	0.1	0.2	0.1	0.2	0.1
Soap	0.6	0.6	0.6	0.6	0.6	0.6	0.6
Ethylenediamine disuccinic acid	0.1	0.1	0.1	0.1	0.1	0.1	0.1
Acrylate/maleate copolymer	1.5	1.5	1.5	1.5	1.5	1.5	1.5
Hydroxyethane di(methylene phosphonic acid)	0.4	0.4	0.4	0.4	0.4	0.4	0.4
Mono-C_{12-14} alkyl, di-methyl, mono-hydroxyethyl quaternary ammonium chloride	0.5	0.5	0.5	0.5	0.5	0.5	0.5
Linear alkyl benzene	0.1	0.1	0.2	0.1	0.1	0.2	0.1
Linear alkyl benzene sulphonate	10.3	10.1	19.9	14.7	10.3	17	10.5
Magnesium sulphate	0.4	0.4	0.4	0.4	0.4	0.4	0.4
Sodium carbonate	19.5	19.2	10.1	18.5	29.9	10.1	16.8
Sodium sulphate	29.6	29.8	38.8	15.1	24.4	19.7	19.1
Sodium Chloride	0.1	0.1	0.1	0.1	0.1	0.1	0.1
Zeolite	9.6	9.4	8.1	18	10	13.2	17.3
Photobleach particle	0.1	0.1	0.2	0.1	0.2	0.1	0.2
Blue and red carbonate speckles	1.8	1.8	1.8	1.8	1.8	1.8	1.8
Ethoxylated Alcohol AE7	1	1	1	1	1	1	1
Tetraacetyl ethylene diamine agglomerate (92wt% active)	0.9	0.9	0.9	0.9	0.9	0.9	0.9
Citric acid	1.4	1.4	1.4	1.4	1.4	1.4	1.4
PDMS/clay agglomerates (9.5% wt% active PDMS)	10.5	10.3	5	15	5.1	7.3	10.2
Polyethylene oxide	0.2	0.2	0.2	0.2	0.2	0.2	0.2
Enzymes e.g. Protease (84mg/g active), Amylase (22mg/g active)	0.2	0.3	0.2	0.1	0.2	0.1	0.2
Suds suppressor agglomerate (12.4 wt% active)	0.2	0.2	0.2	0.2	0.2	0.2	0.2
Sodium percarbonate (having from 12% to 15% active AvOx)	7.2	7.1	4.9	5.4	6.9	19.3	13.1
Perfume oil	0.5	0.5	0.5	0.5	0.5	0.5	0.5

(continued)

Component	Wt % in the Composition						
	4A	4B	4C	4D	4E	4F	9G
Solid perfume particles	0.4	0	0.4	0.4	0.4	0.4	0.6
Balance Water*	*	*	*	*	*	*	*

Claims

1. A laundry treatment composition comprising 1,2-benzisothiazol-3(2*H*)-one.

2. The laundry treatment composition according to claim 1, wherein the laundry treatment composition is selected from a laundry detergent composition, a laundry softening composition, a laundry conditioning composition, a laundry perfuming composition or a mixture thereof.

3. The laundry treatment composition according to any preceding claims wherein the laundry treatment composition is selected from a liquid, a gel, a powder or a mixture thereof.

4. The laundry treatment composition according to any preceding claims comprising between 0.5ppm and 200ppm, preferably between 1ppm and 110ppm of the 1,2-benzisothiazol-3(2*H*)-one.

5. The laundry treatment composition according to any preceding claims, wherein the laundry treatment composition is a liquid laundry detergent composition and comprises between 40% and 80%, preferably between 50% and 75% by weight of the liquid laundry detergent composition of water, and wherein the liquid laundry detergent composition comprises between 25ppm and 110ppm, preferably between 30ppm and 105ppm of 1,2-benzisothiazol-3(2*H*)-one.

6. The laundry treatment composition according to claims 1-4, wherein the laundry treatment composition is a liquid fabric softening composition and comprises between 70% and 98%, preferably between 75% and 95% by weight of the liquid fabric softening composition of water, and wherein the liquid fabric softening composition comprises between 0ppm and 2ppm, preferably between 0.001ppm and 1.75ppm, even more preferably between 0.01ppm and 1.5ppm of 1,2-benzisothiazol-3(2*H*)-one.

7. The laundry treatment composition according to claims 1-4, wherein the laundry treatment composition is a powder laundry detergent composition and wherein the powder laundry detergent composition comprises between 0ppm and 2ppm, preferably between 0.001ppm and 1.75ppm, even more preferably between 0.01ppm and 1.5ppm of 1,2-benzisothiazol-3(2*H*)-one.

8. The laundry treatment composition according to claims 1-4, wherein the laundry treatment composition is a compacted liquid laundry detergent composition and wherein the compacted liquid treatment composition comprises between 1% and 50%, preferably between 1% and 40% by weight of the compacted liquid laundry detergent composition of water, and wherein the compacted liquid laundry detergent composition comprises between 0.5ppm and 25ppm, preferably between 0.5ppm and 20ppm, even more preferably between 0.5ppm and 15ppm of 1,2-benzisothiazol-3(2*H*)-one;
preferably, wherein the compacted liquid laundry detergent composition is comprised in a water-soluble unit dose article wherein the water-soluble unit dose article comprises a water-soluble polyvinyl alcohol film, and wherein the compacted liquid laundry detergent composition comprised in the water-soluble unit dose article comprises between 1% and 25%, preferably between 2% and 13% by weight of the liquid laundry detergent composition of water.

9. The laundry treatment composition according to any preceding claims, wherein the laundry treatment composition comprises less than 15ppm of 2-Methyl-1,2-thiazol-3(2*H*)-one.

10. The laundry treatment composition according to any preceding claims wherein the laundry treatment composition comprises an adjunct material, wherein the adjunct material is preferably selected from linear alkylbenzene sulphonate, alkyl sulphate, alkoxylated alkyl sulphate, fatty alcohol ethoxylates, amine oxide, fatty acid, neutralised fatty acid salt, citric acid, ethoxylated polyethyleneimine, zwitterionic polyamine, amphiphilic graft copolymer, polyester

terephthalate, monoethanolamine, triethanolamine, ethanol, glycerol, dipropylene glycol, 1,2-propanediol, hemicellulases, peroxidases, proteases, cellulases, xylanases, lipases, phospholipases, esterases, cutinases, pectinases, keratanases, reductases, oxidases, phenoloxidases, lipoxygenases, ligninases, pullulanases, tannases, pentosanases, malanases, β-glucanases, arabinosidases, hyaluronidase, chondroitinase, laccase, amylases, brighteners, hydrogenated castor oil, perfumes, core/shell perfume capsules, silicones, ester quaternary ammonium compounds, bleaches, carbonates, silicates, sulphates, polyethylene glycol, dyes, hueing dyes, as ethylenediamine-N'N'-disuccinic acid (EDDS) and/or hydroxyethane diphosphonic acid (HEDP), tetraacetylethylene diamine (TAED) and/or nonanoyloxybenzenesulphonate (NOBS), or mixture thereof.

11. A method of making a laundry treatment composition according to any preceding claims wherein the method comprises;

a. a step of directly mixing 1,2-benzisothiazol-3(2*H*)-one with other ingredients commonly used in liquid treatment compositions; or
b. a step of preparing a perfume capsule premix, wherein the perfume capsule premix comprises perfume core/shell capsules, wherein the perfume core/shell capsules comprise perfume and a shell, wherein the shell is made from melamine formaldehyde, polyacrylate or a mixture thereof, and wherein the perfume capsule premix comprises between 50ppm and 100ppm, preferably between 60ppm and 80ppm of 1,2-benzisothiazol-3(2*H*)-one, and adding the perfume capsule premix to other ingredients commonly used in laundry treatment compositions so that the laundry treatment composition comprises between 0.1% and 5%, preferably between 0.2% and 2.5% by weight of the laundry treatment composition of perfume core/shell capsules; or
c. a step of preparing a structurant premix, wherein the thickener premix comprises a structurant, preferably hydrogenated castor oil, and wherein the structurant premix comprises between 80ppm and 120ppm, preferably between 90ppm and 100ppm of 1,2-benzisothiazol-3(2*H*)-one, and adding the structurant premix to other ingredients commonly used in laundry treatment compositions so that the laundry treatment composition comprises between 0.01% and 1%, preferably between 0.03% and 0.5%, more preferably between 0.05% and 0.2% of the structurant, preferably of hydrogenated castor oil; or
d. adding 1,2-benzisothiazol-3(2*H*)-one as a premix with one or more other materials typically used in the laundry treatment composition; or
e. a mixture thereof.

12. A method of treating fabrics, comprising the steps of diluting the fabric treatment composition according to any preceding claims in water by between 100 and 3000, preferably between 100 and 800 fold to make a treatment liquor and contacting fabrics with said treatment liquor.

13. The use of 1,2-benzisothiazol-3(2*H*)-one in a laundry treatment composition to reduce microbial growth in the laundry treatment composition.

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EUROPEAN SEARCH REPORT

Application Number
EP 18 17 0870

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Category	Citation of document with indication, where appropriate, of relevant passages	Relevant to claim	CLASSIFICATION OF THE APPLICATION (IPC)
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X	US 6 491 840 B1 (FRANKENBACH GAYLE MARIE [US] ET AL) 10 December 2002 (2002-12-10) * columns 94-106; example I * * column 17, lines 48-53 * * column 5, lines 10-12 * * example II * * the whole document * -----	1-13	
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The present search report has been drawn up for all claims

Place of search	Date of completion of the search	Examiner
The Hague	12 October 2018	Yildirim, Zeynep

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X : particularly relevant if taken alone
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