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(54) Laundry treatment compositions

(57) According to the invention there is provided a laundry treatment composition including an insoluble fluorinated organic polymer particle for use in the wash cycle. A method for applying these compositions during the wash cycle of a laundry process as well as the use of these particles to reduce clothes damage is also included.

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Description

FIELD OF INVENTION

[0001] The present invention relates to wash added, laundry detergent compositions and methods for using the same during the wash cycle of a consumer laundry process.

BACKGROUND

[0002] Coloured clothes are extremely popular with consumers. To remove dirt on washing, the clothes are vigorously agitated in water with a washing formulation. This process leads to damage on the surface of the clothes, which reduces their aesthetic appeal. This damage is particularly a problem when granular laundry compositions are used.

[0003] EP 1 478 720 (Proctor & Gamble) discloses the use of dispersible polyolefin waxes in detergent formulations with mean particle sizes from 5nm to 5 microns.

SUMMARY OF INVENTION

[0004] We have found that insoluble fluorinated organic polymer particles provide improved colour care by reducing damage caused by fabric laundering.

[0005] In one aspect the present invention provides a laundry treatment composition comprising:

(i) from 0.1 wt.% to 40 wt.% of an insoluble fluorinated organic polymer particle, the particle having a size in the range from 0.005 to 3000 microns; and,
(ii) from 2 to 70 wt.% of a surfactant.

[0006] A second aspect of the invention provides a domestic method of treating a textile, the method comprising the steps of:

(i) treating a textile with an aqueous solution of from 1 to 20 g/l of the composition of the first aspect; and,
(ii) rinsing and drying the textile.

[0007] A third aspect of the invention provides the use of insoluble fluorinated organic polymer particle to reduce damage to clothes laundered during a domestic main wash process.

DETAILED DESCRIPTION OF THE INVENTION

[0008] The amount of components present in the laundry treatment composition quoted herein are wt.% of total composition unless otherwise stated.

[0009] Except in the operating and comparative examples, or where otherwise explicitly indicated, all numbers in this description indicating amounts or ratios of material or conditions of reaction, physical properties of materials and/or use are to be understood as modified by the word "about".

[0010] The laundry treatment composition may take the form of an isotropic liquid, a surfactant-structured liquid, a granular, spray-dried or dry-blended powder, a tablet, a paste, a molded solid or any other laundry detergent form known to those skilled in the art. The composition is preferably a liquid or granular laundry composition, most preferably a granular laundry composition.

[0011] The insoluble fluorinated organic polymer particle can comprise a single fluorinated organic polymer, or a mixture of two or more fluorinated organic polymers as defined.

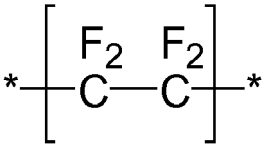
[0012] Preferably the fluorinated organic polymer is selected from fluorinated polyolefin or fluorinated alkoxy polymer.

[0013] Preferably the fluorinated polyolefin is selected from fluorinated polyethylene (preferably polytetrafluoroethylene), fluorinated polypropylene (preferably polyhexafluoropropylene) or a copolymer of fluorinated ethylene and fluorinated propylene.

[0014] Examples of preferred fluorinated organic polymer structures are shown below, * indicates repeats of the defined unit, the polymer is terminated with a terminal group.

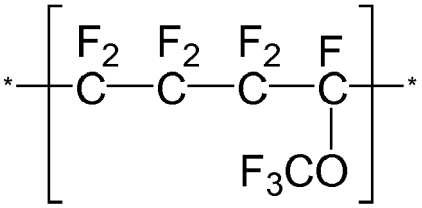
[0015] Fluorinated polyethylenes:-

- a preferred example is polytetrafluoroethylene:



[0016] Fluorinated alkoxy polymers:-

- a preferred example is a perfluoroalkoxy alkane polymer of structure:



[0017] By 'insoluble' used herein in relation to the fluorinated organic polymer particles, it is meant that the fluorinated organic polymer particle should not dissolve in water or surfactant solutions. Such that when 1g/L of particles are placed into an aqueous solution containing 2g/L of sodium dodecyl sulphate at room temperature and shaken at 100 RPM on a rotator shaker at 293K for 2 hours, then removed from solution by filtering through a sieve or filter paper of appropriate size and dried, then the weight of the particle removed is within 95%, preferably 99% by weight of that added.

[0018] The insoluble fluorinated organic polymer particles are present in the laundry treatment composition at a level of from 0.1 to 40 wt.%, preferably from 0.5 to 5 wt.%.

[0019] The insoluble fluorinated organic polymer particle has a size of from 0.005 to 3000 microns, preferably from 0.1 to 2500 microns.

[0020] The size of the insoluble fluorinated organic polymer particle means the maximum value of the largest dimension of the particle.

[0021] The size of the insoluble fluorinated organic polymer particle is measured using graded sieves and it is that which is retained or passes through such sieves.

[0022] The insoluble fluorinated organic polymer particle comprises from 5 to 100 wt.%, preferably from 70 to 100 wt.%, more preferably from 95 to 100 wt.% of the fluorinated organic polymer.

[0023] The fluorinated organic polymers have a weight average molecular weight of greater than 2000 Daltons, preferably greater than 10000 Daltons. The weight average molecular weight may be measured by vapour phase osmometry or cryoscopy.

[0024] Preferably the insoluble fluorinated organic polymer particles are white, such that when their colour is measured using a reflectometer (UV excluded) and expressed as CIE L*a*b* values, L*>70, a* is between -3 and +3 and b* is between 5 and -10.

SURFACTANT

[0025] The composition comprises between 2 to 70 wt.% of a surfactant, most preferably 10 to 30 wt.%. In general, the nonionic and anionic surfactants of the surfactant system may be chosen from the surfactants described "Surface Active Agents" Vol. 1, by Schwartz & Perry, Interscience 1949, Vol. 2 by Schwartz, Perry & Berch, Interscience 1958, in the current edition of "McCutcheon's Emulsifiers and Detergents" published by Manufacturing Confectioners Company or in "Tenside-Taschenbuch", H. Stache, 2nd Edn., Carl Hauser Verlag, 1981. Preferably the surfactants used are saturated.

[0026] Suitable nonionic detergent compounds which may be used include, in particular, the reaction products of compounds having a hydrophobic group and a reactive hydrogen atom, for example, aliphatic alcohols, acids, amides or alkyl phenols with alkylene oxides, especially ethylene oxide either alone or with propylene oxide. Specific nonionic detergent compounds are C_6 to C_{22} alkyl phenol-ethylene oxide condensates, generally 5 to 25 EO, i.e. 5 to 25 units of ethylene oxide per molecule, and the condensation products of aliphatic C_8 to C_{18} primary or secondary linear or branched alcohols with ethylene oxide, generally 5 to 40 EO.

[0027] Suitable anionic detergent compounds which may be used are usually water-soluble alkali metal salts of organic sulphates and sulphonates having alkyl radicals containing from about 8 to about 22 carbon atoms, the term alkyl being used to include the alkyl portion of higher acyl radicals. Examples of suitable synthetic anionic detergent compounds are sodium and potassium alkyl sulphates, especially those obtained by sulphating higher C_8 to C_{18} alcohols, produced for example from tallow or coconut oil, sodium and potassium alkyl C_9 to C_{20} benzene sulphonates, particularly sodium linear secondary alkyl C_{10} to C_{15} benzene sulphonates; and sodium alkyl glyceryl ether sulphates, especially those ethers of the higher alcohols derived from tallow or coconut oil and synthetic alcohols derived from petroleum. The preferred anionic detergent compounds are sodium C_{11} to C_{15} alkyl benzene sulphonates and sodium C_{12} to C_{18} alkyl sulphates. Also applicable are surfactants such as those described in EP-A-328 177 (Unilever), which show resistance to salting-out, the alkyl polyglycoside surfactants described in EP-A-070 074, and alkyl monoglycosides.

[0028] Preferred surfactant systems are mixtures of anionic with nonionic detergent active materials, in particular the groups and examples of anionic and nonionic surfactants pointed out in EP-A-346 995 (Unilever). Especially preferred is surfactant system that is a mixture of an alkali metal salt of a C_{16} to C_{18} primary alcohol sulphate together with a C_{12} to C_{15} primary alcohol 3 to 7 EO ethoxylate.

[0029] The nonionic detergent is preferably present in amounts greater than 10%, e.g. 25 to 90 wt.% of the surfactant system. Anionic surfactants can be present for example in amounts in the range from about 5 wt.% to about 40 wt.% of the surfactant system.

BUILDERS OR COMPLEXING AGENTS

[0030] The composition optionally comprises from 1 to 50 wt.% of a builder. Preferably the builder is present at a level of from 1 to 40 wt.%.

[0031] Builder materials may be selected from 1) calcium sequestrant materials, 2) precipitating materials, 3) calcium ion-exchange materials and 4) mixtures thereof.

[0032] It is preferred that when an insoluble inorganic builder, e.g., zeolite is used, the size is in the range 0.1 to 10 microns (as measured by The Mastersizer 2000 particle size analyzer using laser diffraction ex Malvern™).

[0033] Examples of calcium sequestrant builder materials include alkali metal polyphosphates, such as sodium tripolyphosphate and organic sequestrants, such as ethylene diamine tetraacetic acid.

[0034] Examples of precipitating builder materials include sodium orthophosphate and sodium carbonate.

[0035] Examples of calcium ion-exchange builder materials include the various types of water-insoluble crystalline or amorphous aluminosilicates, of which zeolites are the best known representatives, e.g. zeolite A, zeolite B (also known as zeolite P), zeolite C, zeolite X, zeolite Y and also the zeolite P-type as described in EP-A-0,384,070.

[0036] The composition may also contain 0-50 wt.% of a builder or complexing agent such as ethylenediaminetetraacetic acid, diethylenetriamine-pentaacetic acid, alkyl- or alkenylsuccinic acid, nitrilotriacetic acid or the other builders mentioned below. Many builders are also bleach-stabilising agents by virtue of their ability to complex metal ions.

[0037] Zeolite and carbonate (carbonate (including bicarbonate and sesquicarbonate) are preferred builders.

[0038] The composition may contain as builder a crystalline aluminosilicate, preferably an alkali metal aluminosilicate, more preferably a sodium aluminosilicate. This is typically present at a level of less than 15 wt.%. Aluminosilicates are materials having the general formula:

$$0.8\text{-}1.5\ M_2O.\ Al_2O_3.\ 0.8\text{-}6\ SiO_2$$

where M is a monovalent cation, preferably sodium. These materials contain some bound water and are required to have a calcium ion exchange capacity of at least 50 mg CaO/g. The preferred sodium aluminosilicates contain 1.5-3.5 SiO_2 units in the formula above. They can be prepared readily by reaction between sodium silicate and sodium aluminate, as amply described in the literature. The ratio of surfactants to aluminosilicate (where present) is preferably greater than 5:2, more preferably greater than 3:1.

[0039] Alternatively, or additionally to the aluminosilicate builders, phosphate builders may be used. In this art the term 'phosphate' embraces diphosphate, triphosphate, and phosphonate species. Other forms of builder include silicates, such as soluble silicates, metasilicates, layered silicates (e.g. SKS-6 from Hoechst).

[0040] Preferably the laundry detergent formulation is a non-phosphate built laundry detergent formulation, i.e., contains less than 1 wt.% of phosphate.

SHADING AGENT

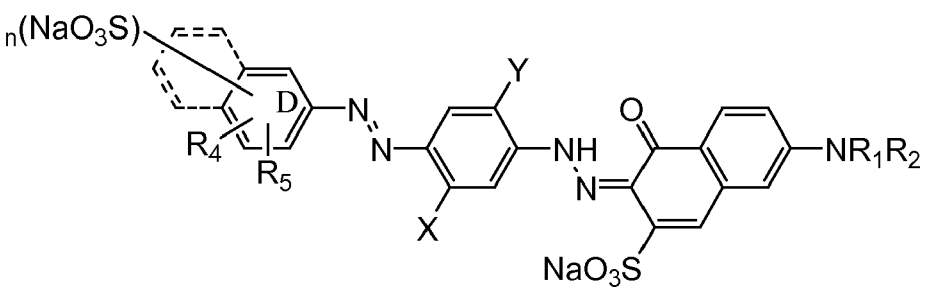
[0041] The laundry treatment composition preferably comprises a blue or violet shading agent in the range from 0.0001 to 0.01 wt.%. The shading agents reduce the perception of damage to many coloured garments and increase whiteness of white garments.

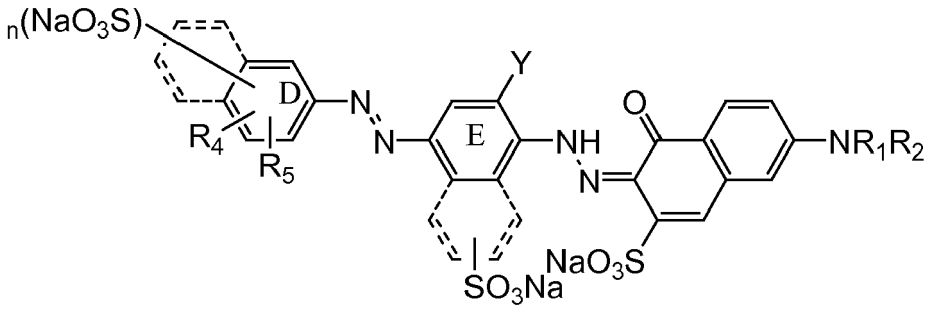
[0042] The shading agents are preferably selected from blue and violet dyes of the solvent disperse basic, direct and acid type listed in the colour index (Society of Dyers and Colourists and American Association of Textile Chemists and Colorists 2002).

[0043] Preferably a direct violet or direct blue dyes is present. Preferably the dyes are *bis*-azo, *tris*-azo dyes or triphendioxazine dye. The carcinogenic benzidene based dyes are not preferred.

[0044] Bis-azo copper containing dyes such as direct violet 66 may be used.

[0045] The most preferred bis-azo dyes have the following structure:





wherein:

ring D and E may be independently naphthyl or phenyl as shown;
R_1 is selected from: hydrogen and C1-C4-alkyl, preferably hydrogen;
R_2 is selected from: hydrogen, C1-C4-alkyl, substituted or unsubstituted phenyl and substituted or unsubstituted naphthyl, preferably phenyl;
R_3 and R_4 are independently selected from: hydrogen and C1-C4-alkyl, preferably hydrogen or methyl;
X and Y are independently selected from: hydrogen, C1-C4-alkyl and C1-C4-alkoxy; preferably the dye has X= methyl; and, Y = methoxy and n is 0, 1 or 2, preferably 1 or 2.

[0046] Preferred bis-azo dyes are direct violet 7, direct violet 9, direct violet 11, direct violet 26, direct violet 31, direct violet 35, direct violet 40, direct violet 41, direct violet 51, and direct violet 99.

[0047] Preferred solvent and disperse dyes, are selected from, mono-azo or anthraquinone dyes, most preferably, solvent violet 13, disperse violet 27 disperse violet 26, disperse violet 28, disperse violet 63 and disperse violet 77.

[0048] A preferred pigment is pigment violet 23.

ENZYMES

[0049] The laundry treatment composition preferably comprises one or more enzymes which provide cleaning performance and/or fabric care benefits. Examples of suitable enzymes include, but are not limited to, hemicellulases, peroxidases, proteases, cellulases, xylanases, lipases, phospholipases, esterases, cutinases, pectinases, mannanases, pectate lyases, keratinases, reductases, oxidases, phenoloxidases,- lipoxygenases, ligninases, pullulanases, tannases, pentosanases, malanases, arabinosidases, hyaluronidase, chondroitinase, laccase, and amylases, or mixtures thereof. A typical combination is an enzyme cocktail that may comprise, for example, a protease and lipase in conjunction with

amylase. When present in a cleaning composition, the aforementioned additional enzymes may be present at levels from about 0.00001 wt.% to about 2 wt.%, from about 0.0001 wt.% to about 1 wt.% or even from about 0.001 wt.% to about 0.5 wt.% enzyme protein by weight of the composition.

[0050] Preferred enzymes are cellulases.

FLUORESCENT AGENT

[0051] The composition preferably comprises a fluorescent agent (optical brightener). Fluorescent agents are well known and many such fluorescent agents are available commercially. Usually, these fluorescent agents are supplied and used in the form of their alkali metal salts, for example, the sodium salts. The total amount of the fluorescent agent or agents used in the composition is generally from 0.005 to 2 wt.%, more preferably 0.01 to 0.1 wt.%. Preferred classes of fluorescer are: Di-styryl biphenyl compounds, e.g. Tinopal (Trade Mark) CBS-X, Di-amine stilbene di-sulphonic acid compounds, e.g. Tinopal DMS pure Xtra and Blankophor (Trade Mark) HRH, and Pyrazoline compounds, e.g. Blankophor SN. Preferred fluorescers are: sodium 2-(4-styryl-3-sulfophenyl)-2H-napthol[1,2-d]trazole, disodium 4,4'-bis{[(4-anilino-6-(N methyl-N-2 hydroxyethyl) amino 1,3,5-triazin-2-yl)]amino}stilbene-2-2' disulfonate, disodium 4,4'-bis{[(4-anilino-6-morpholino-1,3,5-triazin-2-yl)]amino} stilbene-2-2' disulfonate, and disodium 4,4'-bis(2-sulfoslyryl)biphenyl.

PERFUME

[0052] Preferably the composition comprises a perfume. The perfume is preferably in the range from 0.001 to 3 wt. %, most preferably 0.1 to 1 wt.%. Many suitable examples of perfumes are provided in the CTFA (Cosmetic, Toiletry and Fragrance Association) 1992 International Buyers Guide, published by CFTA Publications and OPD 1993 Chemicals Buyers Directory 80th Annual Edition, published by Schnell Publishing Co.

[0053] It is commonplace for a plurality of perfume components to be present in a formulation. In the compositions of the present invention it is envisaged that there will be four or more, preferably five or more, more preferably six or more or even seven or more different perfume components.

[0054] In perfume mixtures preferably 15 to 25 wt.% are top notes. Top notes are defined by Poucher (Journal of the Society of Cosmetic Chemists 6(2):80 [1955]). Preferred top-notes are selected from citrus oils, linalool, linalyl acetate, lavender, dihydromyrcenol, rose oxide and cis-3-hexanol.

[0055] Perfume and top note may be used to cue the fabric care benefit of the invention.

[0056] It is preferred that the laundry treatment composition does not contain a peroxygen bleach, e.g., sodium percarbonate, sodium perborate, and peracid.

POLYMERS

[0057] The composition may comprise one or more polymers. Examples are carboxymethylcellulose, poly(ethylene glycol), poly(vinyl alcohol), polycarboxylates such as polyacrylates, maleic/acrylic acid copolymers and lauryl methacrylate/acrylic acid copolymers.

[0058] Polymers present to prevent dye deposition, for example poly(vinylpyrrolidone), poly(vinylpyridine-N-oxide), and poly(vinylimidazole), are preferably absent from the formulation.

HYDROTROBE

[0059] For compositions in the form of a liquid, it is useful to include a hydrotrope, which prevents liquid crystal formation. The addition of the hydrotrope thus aids the clarity/transparency of the composition. Suitable hydrotropes include but are not limited to propylene glycol, ethanol, urea, salts of benzene sulphonate, toluene sulphonate, xylene sulphonate or cumene sulphonate.

[0060] Suitable salts include but are not limited to sodium, potassium, ammonium, monoethanolamine, triethanolamine. Preferably, the hydrotrope is selected from the group consisting of propylene glycol, xylene sulfonate, ethanol, and urea to provide optimum performance. The amount of the hydrotrope is generally in the range of from 0 to 30%, preferably from 0.5 to 30%, more preferably from 0.5 to 30%, most preferably from 1 to 15%.

Experimental

Example 1

[0061] Three knitted cotton fabric swatches (20 by 20 cm) dyed with Vat Blue 4 were washed in a compartment of a QuickWash Plus™ fabric testing system (SDL international). The machine was filled with 3.5 litres of 26° French Hard

water and 24.5 g of Persil Colour Powder (ex UK) a Las/Non-ionic surfactant powder built with zeolite and carbonate. To this was added 0.5 g of antifoam. The wash took 15 minutes, and following this the machine was drained, spun, and then three 90 second rinses performed, draining and spinning after each. Following the wash the fabric was tumble dried. The procedure was repeated 5 times. The whole experiment was then repeated but with the addition of 1g/L of various additives.

[0062] Following the washes, the reflectances of the cloths at 430nm were measured on a Murakami Goniospectrophotometer with an incident angle of 65° and a measurement angle of 55°. The reflectance was compared to the reflectance of new unwashed fabric, and expressed as:-

$$\Delta R_{430} = |R_{430}(new) - R_{430}(washed)|.$$

[0063] The results are shown below in table 1.

Table 1

Product	ΔR_{430}
Powder Control	6.1
NanoFLON P47A A polytetrafluoroethylene particle Average particle size 150-500nm	4.3
Crayvallac WF9200 A polytetrafluoroethylene modified polyethylene particle Average particle size 6-9μm	4.6

[0064] NanoFLON P47A was obtained from Shamrock Technologies, and Crayvallac WF9200 was obtained from Crayvallac™.

[0065] The lower reflectance values indicate less fabric damage from the laundering process. The results in table 1 show an improvement in the reflectance values when the insoluble fluorinated organic polymer particles are incorporated.

Example 2

Exemplary Granular Laundry Formulations A,B,C,D

[0066]

Formulation	A	B	C	D
NaLAS	15	20	10	14
NI(7EO)	-	-	-	10
Na tripolyphosphate	-	15	-	-
Soap	-	-	-	2
Zeolite A24	7	-	-	17
Sodium silicate	5	4	5	1
Sodium carbonate	25	20	30	20
Sodium sulphate	40	33	40	22
Carboxy methylcellulose	0.2	0.3	-	0.5
Sodium chloride	-	-	-	5
lipase	0.005	0.01	-	0.005
Protease	0.005	0.01	-	0.005
Amylase	0.001	0.003	-	-
Cellulase	-	0.003	-	-
Fluorescer	0.1	0.15	0.05	0.3
Direct Violet 9	0.0002	0.0001 5	-	0.0001

(continued)

Formulation	A	B	C	D
Solvent Violet 13	-	0.002	-	0.001
NanoFLON P47A	1	0.5	0.5	0.5
Sulfonated Zn Pthalocyanine photobleach	0.002	0.004	-	-
Water, impurities & minors	To 100 wt.%	To 100 wt.%	To 100 wt.%	To 100 wt.%

[0067] Enzyme levels are given as percent pure enzyme. Levels of direct violet 9, solvent violet 13 and Sulfonated Zn Pthalocyanine photobleach are given as pure dye. NI(7EO) refers to R-$(OCH_2CH_2)_nOH$, where R is an alkyl chain of C12 to C15, and n is 7.

[0068] The formulations are prepared by adding direct violet 9, and the Sulfonated Zn Pthalocyanine photobleach into the slurry which is then spray dried. Alternatively, the dyes and photobleach may be added via post-dosed $MgSO_4$ granules.

[0069] The solvent violet 13 was dissolved in non-ionic surfactant (7E0) and granulated onto bentonite clay, to give a granule containing 0.2 wt.% dye. This was post-dosed to the formulation.

[0070] The NanoFLON P47A particles were post dosed to the formulation.

Example 3

[0071] The following exemplary liquid laundry formulations E-H were created.

Formulation	E	F	G	H
NaLAS	14	10	15	21
NI(7EO)	10	5	21	15
SLES(3EO)	7	10	7	-
Soap	2	4	1	0
Citric acid	1	1	-	1
Glycerol	0	1	5	0
Propylene glycol	5	3	0	4
Sodium chloride	1	-	-	-
Amine ethoxylated polymers	0.5	1	-	-
Triethanol amine	0	0.5	3	1
Perfume	0.2	0.1	0.3	0.4
Fluorescer	0.05	0.1	0.15	0.2
Protease	0.005	0.01	-	0.005
Amylase	0.001	0.003	-	-
Lipase	-	0.003	-	-
Fluorescer	0.1	0.15	0.05	0.3
NanoFLON P47A	0.1	0.2	0.15	0.5
Solvent Violet 13	-	0.002	0	0.001
Water, impurities & minors	To 100 wt.%	To 100 wt.%	To 100 wt.%	To 100 wt.%

[0072] Enzyme levels are given as percent pure enzyme. Levels of solvent violet 13 are given as pure dye. NI(7EO) refers to R-$(OCH_2CH_2)_nOH$, where R is an alkyl chain of C12 to C15, and n is 7. NaLAS is linear alkyl benzene sulphonate (LAS) and (SLES(3EO)) is C_{12}-C_{18} alkyl polyethoxylate (3.0) sulphate.

Example 4

[0073] A rinse conditioner formulation, for use in the rinse stage of the wash was also created. It contained 13.7 wt. % N,N-di(tallowoyloxyethyl)-N,N-dimethylammonium chloride, 1.5 wt.% perfume, 1 wt.% NanoFLON P47A, with the remainder being minors and water.

Claims

1. A laundry treatment composition comprising:

   (i) from 0.1 wt.% to 40 wt.% of an insoluble fluorinated organic polymer particle, the particle having a size in the range from 0.005 to 3000 microns; and,
   (ii) from 2 to 70 wt.% of a surfactant.

2. A laundry treatment composition according to claim 1, further comprising a builder at a level of from 1 to 50 wt.%.

3. A laundry treatment composition according to claim 1 or claim 2, wherein the fluorinated organic polymer is selected from fluorinated polyolefin or fluorinated alkoxy polymer.

4. A laundry treatment composition according to any one of claims 1 to 3, wherein the fluorinated polyolefin is selected from fluorinated polyethylene, fluorinated polypropylene or a copolymer of fluorinated ethylene and fluorinated propylene.

5. A laundry treatment composition according to any preceding claim, wherein the insoluble fluorinated organic polymer particle has a size in the range from 0.1 to 2500 microns.

6. A laundry treatment composition according to any preceding claim, wherein the insoluble fluorinated organic polymer particle is present at a level of from 0.5 to 5 wt.%.

7. A laundry treatment composition according to any one of claims 1 to 6, wherein the insoluble fluorinated organic polymer particle comprises from 5 to 100 wt.% of the fluorinated organic polymer.

8. A laundry treatment composition according to any one of claims 1 to 7, wherein the insoluble fluorinated organic polymer particle comprises from 70 to 100 wt.% of the fluorinated organic polymer.

9. A laundry treatment composition according to any one of claims 1 to 8, wherein the fluorinated organic polymers present in the insoluble fluorinated organic polymer particle have a molecular weight greater than 2000 Dalton.

10. A laundry treatment composition according to any one of claims 1 to 9, wherein the composition comprises a blue or violet shading agent in the range from 0.0001 to 0.01 wt.%.

11. A laundry treatment composition according to any one of claims 1 to 10, wherein the composition comprises one or more enzymes, at a level of from about 0.00001 wt.% to about 2 wt.%, preferably the enzyme is a cellulase.

12. A domestic method of treating a textile, comprising the steps of:

    (i) treating a textile with an aqueous solution of from 1 to 20 g/l of the composition of any one of claims 1 to 11; and,
    (ii) rinsing and drying the textile.

13. Use of an insoluble fluorinated organic polymer particle to reduce damage to clothes laundered during a domestic main wash process.

European Patent Office

EUROPEAN SEARCH REPORT

Application Number
EP 08 15 2741

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	US 4 051 046 A (DIEHL FRANCIS LOUVAINE ET AL) 27 September 1977 (1977-09-27)	1-13	INV. C11D3/37
X	* example II * * columns 26,27 * * column 15, line 58 - column 16, line 9 * -----	1,3-5,7, 8,13	

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	28 August 2008	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

EPO FORM 1503 03.82 (P04C01)

ANNEX TO THE EUROPEAN SEARCH REPORT ON EUROPEAN PATENT APPLICATION NO. EP 08 15 2741

This annex lists the patent family members relating to the patent documents cited in the above-mentioned European search report. The members are as contained in the European Patent Office EDP file on
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28-08-2008

Patent document cited in search report	Publication date	Patent family member(s)	Publication date
US 4051046 A	27-09-1977	NONE	

EPO FORM P0459

For more details about this annex : see Official Journal of the European Patent Office, No. 12/82

REFERENCES CITED IN THE DESCRIPTION

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- EP 328177 A **[0027]**
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