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(54) **LAUNDRY CLEANING COMPOSITION**

WÄSCHEREINIGUNGSZUSAMMENSETZUNG

COMPOSITION DE NETTOYAGE TEXTILE

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(73) Proprietors:

- **Unilever IP Holdings B.V.**
3013 AL Rotterdam (NL)
Designated Contracting States:
AL AT BE BG CH CZ DK EE ES FI FR GR HR HU IS LI LT LU LV MC MK NL NO PL PT RO RS SE SI SK SM TR
- **Unilever Global IP Limited**
Wirral, Merseyside CH62 4ZD (GB)
Designated Contracting States:
CY DE GB IE IT MT

(72) Inventors:

- **BATCHELOR, Stephen, Norman**
Bebington
Wirral Merseyside CH63 3JW (GB)

- **BREFFA, Catherine**
65926 Frankfurt am Main (DE)
- **DIEDERICHS, Jan**
84508 Burgkirchen (DE)
- **MUTCH, Kevin, James**
65926 Frankfurt am Main (DE)
- **ROMANSKI, Steffen**
65926 Frankfurt am Main (DE)
- **SCHAEFER, Carsten**
65926 Frankfurt am Main (DE)

(74) Representative: **McHugh, Paul Edward**

Unilever Patent Group
Bronland 14
6708 WH Wageningen (NL)

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Description**Field of Invention**

5 [0001] The present invention concerns a laundry cleaning composition.

Background of the Invention

10 [0002] There is a desire to use less water in the domestic laundering of clothes. This may be achieved by reducing the number of water rinses done after the initial washing. Reducing the number of rinses increases the redeposition of soil removed in the wash, thereby reducing the overall cleaning. The problem is exacerbated by the presence of human sebum on garments and in the wash liquor, which serves to enhance the deposition of soil in the wash. Documents WO 2016/041670 A1 and EP 0 035 478 A1 disclose anti-redeposition agents for laundry cleaning compositions. There is a need for improved dispersants to prevent the deposition of soil present in the wash liquor onto the fabric. Such ingredients are preferably biodegradable and increase stain removal.

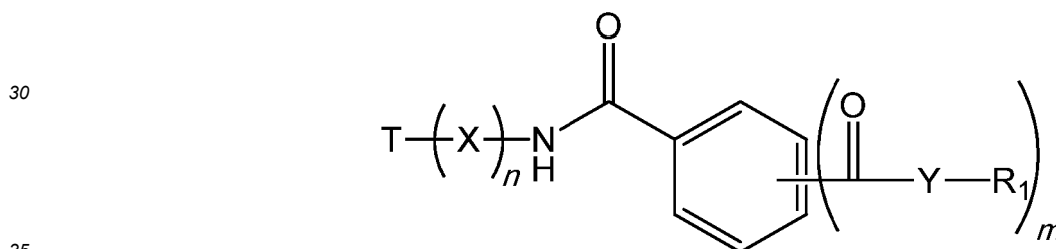
Summary of the Invention

20 [0003] There is a need for technologies to reduce redeposition and enhance cleaning in domestic laundry products.

[0004] We have found that selected alkoxyated dispersants (AD) when incorporated into laundry detergents enhance whiteness and brightness of garments during domestic laundry.

[0005] In a first aspect the present invention provides a laundry cleaning composition comprising:

25 (i) from 0.2 to 20 wt.%, preferably 0.5 to 12 wt.%, most preferably 1 to 10 wt.% of an alkoxyated dispersant of the following structure:



wherein:

40 X is selected from: ethoxy; and mixtures of ethoxy and propoxy groups, wherein the number of ethoxy groups is greater than the number of propoxy groups, and wherein n is from 6 to 70;
 m is 2;

R_1 is selected from: branched and linear C8 to C20 alkyl chains, uncharged aryl groups; and, uncharged alkyl-aryl groups, wherein the alkyl group of the alkyl-aryl is a saturated linear or branched C1 to C3;

45 T is CH_3 ;

Y is selected from O;

(ii) from 0 to 50 wt.% surfactant, other than the alkoxyated dispersant; and,

50 (iii) an active selected from one or more of the following: from 0.001 to 3 wt.% perfume; from 0.0001 to 0.5 wt.% of fluorescent agent; and, from 0.0001 wt.% to 0.1 wt.% of an enzyme.

[0006] Preferably R_1 is selected from C12 to C18 linear alkyl chains; and benzyl and phenylethyl in the alkoxyated dispersant structure.

[0007] Most preferably R_1 is selected from C12 to C18 linear alkyl chains.

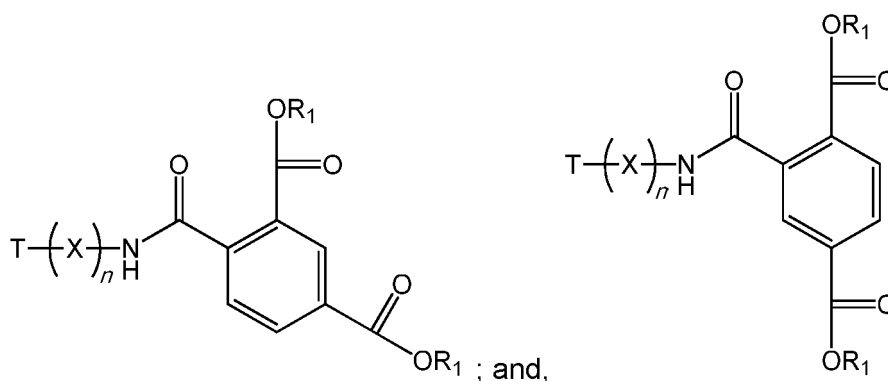
55 [0008] Preferably X is ethoxy in the alkoxyated dispersant structure.

[0009] Preferably n , the mole average number of alkoxy groups, is from 6 to 40, more preferably from 9 to 30, most preferably from 10 to 20 in the alkoxyated dispersant structure.

[0010] Preferably the alkoxyated dispersant is selected from:

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15 **[0011]** A preferred laundry cleaning composition comprises surfactant, other than the alkoxyated dispersant, at a level of from 4 to 40 wt.%, more preferably from 4 to 35 wt.%, most preferably from 6 to 30 wt.%.

[0012] Preferably the surfactant, other than the alkoxyated dispersant, comprises anionic and/or non-ionic surfactants.

20 **[0013]** More preferably the weight fraction of non-ionic surfactant to anionic surfactant is from 0 to 0.3. This means that non-ionic surfactant can be present (or it may be absent if the weight fraction is 0), but if non-ionic surfactant is present, then the weight fraction of the non-ionic surfactant is preferably at most 30% of the total weight of anionic surfactant + non-ionic surfactant, wherein the alkoxyated dispersant is not considered a surfactant as defined herein.

[0014] Preferably the anionic surfactant is selected from: linear alkyl benzene sulphonates; alkyl sulphates; alkyl ether sulphates; alkyl ether carboxylates; and mixtures thereof.

25 **[0015]** If a non-ionic surfactant is present, then preferably the non-ionic surfactant is an alcohol ethoxylate, more preferably an C₁₀-C₁₈ alcohol ethoxylate having an average of 3-10 moles of ethylene oxide, most preferably an C₁₂-C₁₅ alcohol ethoxylate having an average of 5-9 moles of ethylene oxide.

[0016] The laundry cleaning composition is preferably an aqueous laundry liquid detergent composition. Preferably the pH of the aqueous liquid detergent composition is from 6 to 8.5, more preferably from 6.5 to 7.5, even more preferably from 6.8 to 7.2, most preferably 7.0.

30 **[0017]** Preferably the active ingredient is an enzyme and comprises one or more of the following: proteases, alpha-amylases, cellulases, lipases, peroxidases/oxidases, pectate lyases, and mannanases, or mixtures thereof. More preferably the enzyme is a protease, most preferably a subtilase type serine protease.

[0018] In a second aspect, the invention provides a domestic method of treating a textile, the method comprising the steps of:

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(i) treating a textile with an aqueous solution of the alkoxyated dispersant as defined in the first aspect of the invention; the aqueous solution comprising from 10 ppm to 5000 ppm, preferably from 100 ppm to 1000 ppm, of the alkoxyated dispersant as defined herein; and, 0 to 6 g/L, preferably from 0.5 to 6 g/L, more preferably from 1 to 5 g/L of a surfactant, other than the alkoxyated dispersant; and,

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(ii) optionally rinsing and drying the textile;

wherein in the method, one or more of an active ingredient selected from perfume, fluorescent agent and enzyme is present in the aqueous solution of the alkoxyated dispersant,

45 wherein if present, the level of the perfume in the aqueous solution is from 0.1 to 100 ppm; preferably from 1 to 10ppm.

wherein if present, the level of the fluorescent agent in the aqueous solution is from 0.0001 g/l to 0.1 g/L, preferably from 0.001 to 0.02 g/L; and,

wherein if present, the level of the enzyme in the aqueous solution is from 0.01 to 10ppm, preferably 0.05 to 1ppm.

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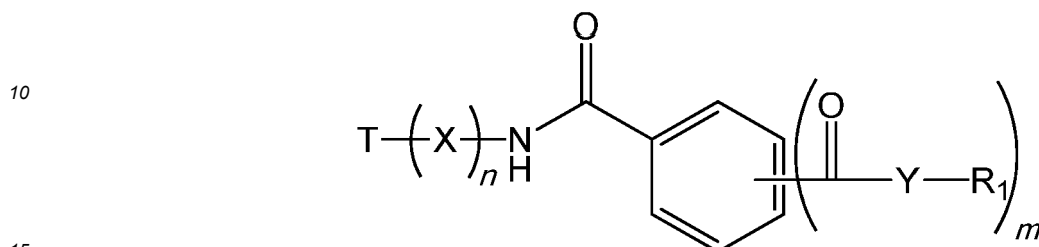
[0019] In the method aspects of the present invention the surfactant used is preferably as preferred for the composition aspects of the present invention.

[0020] Domestic methods are preferably conducted in a domestic washing machine or by hand washing. The temperature of the wash is preferably from 285 to 335 degrees Kelvin.

55 **[0021]** The textile is preferably an item of used clothing, bedding or table cloth. Preferred items of clothing are worn cotton containing shirts, trousers, underwear and jumpers.

Detailed Description of the Invention**Alkoxyated Dispersant**

5 [0022] The alkoxyated dispersant has the following structure:-



wherein:

20 X is selected from: ethoxy; and mixtures of ethoxy and propoxy groups where the number of ethoxy groups is greater than the number of propoxy groups, and wherein n is from 6 to 70;
T is CH_3 .

[0023] The value m is 2.

25 [0024] The alkoxyated dispersant is preferably formed as a reaction product of trimellitic anhydride or pyromellitic dianhydride with a polyether of the form $\text{T}-(\text{X})_n-\text{NH}_2$ and alcohol of the form $\text{R}-\text{OH}$, where R_1 is selected from: branched and linear C8 to C20 alkyl chains, uncharged aryl groups; and, uncharged alkyl-aryl groups wherein the alkyl group of the alkyl-aryl is a saturated linear or branched C1 to C3.

30 [0025] The benzene ring may be substituted by further uncharged organic groups, for example methyl, ethyl, methoxy, ethoxy, Cl, NO_2 . When ArOH is an aromatic alcohol, phenol, for example may be used in the reaction. Preferably the trimellitic anhydride or pyromellitic anhydride is reacted with the polyether $\text{T}-(\text{X})_n-\text{NH}_2$, then the $\text{R}-\text{OH}$.

[0026] Preferably the trimellitic anhydride or pyromellitic anhydride is reacted with 1 mole equivalent of the polyether, $\text{T}-(\text{X})_n-\text{NH}_2$, then the $\text{R}-\text{OH}$.

35 [0027] The value n is the mole average number of alkoxy groups. The value of n may be measured using NMR. The value of n is from 6 to 70, preferably 6 to 40, more preferably 9 to 30. Indeed the value of n may be individually 9, 10, 11, 12, 13, 14; 15; 16; 17; 18; 19; 20; 21; 22; 23; 24; 25; 26; 27; 28; 29, or 30. Most preferably the value of n may be from 10 to 20.

[0028] X is selected from OCH_2CH_2 (ethoxy) and mixtures of ethoxy and propoxy groups, wherein if a mixture, then the number of ethoxy groups is greater than the number of propoxy groups. If X comprises propoxy groups then preferably the mole ratio of ethoxy/propoxy is greater than 2, more preferably greater than 5.

40 [0029] If X is a mixture of ethoxy and propoxy groups, then they may be distributed blockwise alternatively, periodically and/or statistically.

[0030] Preferably X comprises at least one mole of propoxy groups and the mole ratio of ethoxy/propoxy is greater than 5.

45 [0031] In the context of the current invention the alkoxyated dispersant is not considered a surfactant and does not contribute numerically to the surfactant as defined herein.

[0032] The alkoxyated dispersant prevents the deposition of soil present in the wash liquor onto the fabric. The alkoxyated dispersant can also increase stain removal.

Active Ingredient

50 [0033] The laundry cleaning composition comprises an active ingredient selected from one or more of the following: from 0.001 to 3 wt.% perfume; from 0.0001 to 0.5 wt.% of fluorescent agent; and, from 0.0001 wt.% to 0.1 wt.% of an enzyme.

55 [0034] Contemplated enzymes include proteases, alpha-amylases, cellulases, lipases, peroxidases/oxidases, pectate lyases, and mannanases, or mixtures thereof.

[0035] Preferably the enzyme is selected from: proteases, alpha-amylases; cellulases and lipases, or mixtures thereof. More preferably the enzyme is a protease, more preferably a subtilase type serine protease.

[0036] Preferred perfumes and fluorescent agents are described herein.

Surfactant

[0037] In the context of the current invention the alkoxylated dispersant is not considered a surfactant and does not contribute numerically to the surfactant as defined herein.

[0038] The laundry composition may comprise anionic and non-ionic surfactant (which includes a mixture of the same).

[0039] The surfactant is present at a level of from 0 to 50 wt.%. This means that surfactant need not be present, but it is preferred that it is present.

[0040] Preferred laundry cleaning compositions comprise surfactant at a level of from 4 to 40 wt.%, more preferably from 4 to 35 wt.%, most preferably from 6 to 30 wt.%.

[0041] Preferably the surfactant comprises anionic and/or non-ionic surfactants.

[0042] Suitable nonionic and anionic surfactants 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 or in Anionic Surfactants: Organic Chemistry edited by Helmut W. Stache (Marcel Dekker 1996).

[0043] 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 alkyl radicals.

[0044] Examples of suitable synthetic anionic detergent compounds are sodium and potassium alkyl sulphates, especially those obtained by sulphating higher C₈ to C₁₈ alcohols, produced for example from tallow or coconut oil, Alkyl ether carboxylic acids; sodium and potassium alkyl C₉ to C₂₀ benzene sulphonates, particularly sodium linear secondary alkyl C₁₀ to C₁₅ 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.

[0045] The anionic surfactant is preferably selected from: linear alkyl benzene sulphonate; alkyl sulphates; alkyl ether sulphates; alkyl ether carboxylates; soaps; alkyl (preferably methyl) ester sulphonates, and mixtures thereof.

[0046] Preferred anionic surfactants are selected from: linear alkyl benzene sulphonate; alkyl sulphates; alkyl ether sulphates and mixtures thereof. Preferably the alkyl ether sulphate is a C₁₂-C₁₄ n-alkyl ether sulphate with an average of 1 to 3EO (ethoxylate) units. Sodium lauryl ether sulphate is particularly preferred (SLES). Preferably the linear alkyl benzene sulphonate is a sodium C₁₁ to C₁₅ alkyl benzene sulphonates. Preferably the alkyl sulphates is a linear or branched sodium C₁₂ to C₁₈ alkyl sulphates. Sodium dodecyl sulphate is particularly preferred, (SDS, also known as primary alkyl sulphate).

[0047] Preferably two or more anionic surfactant are present, for example linear alkyl benzene sulphonate together with an alkyl ether sulphate.

[0048] Most preferably the anionic surfactant is selected from: linear alkyl benzene sulphonates; alkyl sulphates; alkyl ether sulphates; and mixtures thereof.

[0049] The composition may comprise anionic and/or non-ionic surfactants.

[0050] Preferably the weight fraction of non-ionic surfactant to anionic surfactant is from 0 to 0.3. This means that non-ionic surfactant can be present (or it may be absent if the weight fraction is 0), but if non-ionic surfactant is present, then the weight fraction of the non-ionic surfactant is preferably at most 30% of the total weight of anionic surfactant + non-ionic surfactant.

[0051] Suitable nonionic detergent compounds which may be used include, in particular, the reaction products of compounds having an aliphatic hydrophobic group and a reactive hydrogen atom, for example, aliphatic alcohols, acids or amides, especially ethylene oxide either alone or with propylene oxide. Specific nonionic detergent compounds are the condensation products of aliphatic C₈ to C₁₈ primary or secondary linear or branched alcohols with ethylene oxide.

[0052] If a non-ionic surfactant is present, then most preferably the non-ionic surfactant is an alcohol ethoxylate, more preferably a C₁₀-C₁₈ alcohol ethoxylate having an average of 3-10 moles of ethylene oxide, most preferably an C₁₂-C₁₅ alcohol ethoxylate having an average of 5-9 moles of ethylene oxide.

[0053] Preferably the surfactants used are saturated.

[0054] 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.

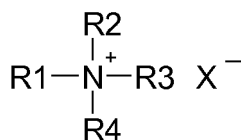
Cationic Compound

[0055] The surfactant may comprise a cationic surfactant

Most preferred are quaternary ammonium compounds.

[0056] It is advantageous if the quaternary ammonium compound is a quaternary ammonium compound having at least one C₁₂ to C₂₂ alkyl chain.

[0057] It is preferred if the quaternary ammonium compound has the following formula:



in which R¹ is a C₁₂ to C₂₂ alkyl or alkenyl chain; R², R³ and R⁴ are independently selected from C₁ to C₄ alkyl chains and X⁻ is a compatible anion. A preferred compound of this type is the quaternary ammonium compound cetyl trimethyl quaternary ammonium bromide.

[0058] A second class of materials for use with the present invention are the quaternary ammonium of the above structure in which R¹ and R² are independently selected from C₁₂ to C₂₂ alkyl or alkenyl chain; R³ and R⁴ are independently selected from C₁ to C₄ alkyl chains and X⁻ is a compatible anion.

[0059] The composition optionally comprises a silicone.

Perfume

[0060] One or more perfumes may be present as whole or part of the active ingredient of the laundry cleaning composition.

[0061] The composition preferably comprises a perfume. The perfume is preferably present in the range from 0.001 to 3 wt.%, more preferably 0.05 to 0.5 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.

[0062] Preferably the perfume comprises at least one note (compound) from: alpha-isomethyl ionone, benzyl salicylate; citronellol; coumarin; hexyl cinnamal; linalool; Pentanoic acid, 2-methyl-, ethyl ester; octanal; benzyl acetate; 1,6-octadien-3-ol, 3,7-dimethyl-, 3-acetate; cyclohexanol, 2-(1,1-dimethylethyl)-, 1-acetate; delta-damascone; beta-ionone; ver-dyl acetate; dodecanal; hexyl cinnamic aldehyde; cyclopentadecanolide; benzeneacetic acid, 2-phenylethyl ester; amyl salicylate; beta-caryophyllene; ethyl undecylenate; geranyl anthranilate; alpha-irone; beta-phenyl ethyl benzoate; alpa-santalol; cedrol; cedryl acetate; cedryl formate; cyclohexyl salicylate; gamma-dodecalactone; and, beta phenylethyl phenyl acetate.

[0063] Useful components of the perfume include materials of both natural and synthetic origin. They include single compounds and mixtures. Specific examples of such components may be found in the current literature, e.g., in Fenaroli's Handbook of Flavor Ingredients, 1975, CRC Press; Synthetic Food Adjuncts, 1947 by M. B. Jacobs, edited by Van Nostrand; or Perfume and Flavor Chemicals by S. Arctander 1969, Montclair, N.J. (USA).

[0064] 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.

[0065] 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.

[0066] The International Fragrance Association has published a list of fragrance ingredients (perfums) in 2011, (<http://www.ifraorg.org/en-us/ingredients#.U7Z4hPIdWzk>).

[0067] The Research Institute for Fragrance Materials provides a database of perfumes (fragrances) with safety information.

[0068] Perfume top note may be used to cue the benefit of the invention.

[0069] Some or all of the perfume may be encapsulated, typical perfume components which it is advantageous to encapsulate, include those with a relatively low boiling point, preferably those with a boiling point of less than 300, preferably 100-250 Celsius. It is also advantageous to encapsulate perfume components which have a low CLog P (i.e., those which will have a greater tendency to be partitioned into water), preferably with a CLog P of less than 3.0. These materials, of relatively low boiling point and relatively low CLog P have been called the "delayed blooming" perfume ingredients and include one or more of the following materials:

allyl caproate, amyl acetate, amyl propionate, anisic aldehyde, anisole, benzaldehyde, benzyl acetate, benzyl acetone, benzyl alcohol, benzyl formate, benzyl iso valerate, benzyl propionate, beta gamma hexenol, camphor gum, laevo-carvone, d-carvone, cinnamic alcohol, cinamyl formate, cis-jasnone, cis-3-hexenyl acetate, cuminic alcohol, cyclal c, dimethyl benzyl carbinol, dimethyl benzyl carbinol acetate, ethyl acetate, ethyl aceto acetate, ethyl amyl ketone, ethyl benzoate, ethyl butyrate, ethyl hexyl ketone, ethyl phenyl acetate, eucalyptol, eugenol, fenchyl acetate, flor acetate (tricyclo decenyl acetate), frutene (tricyclo decenyl propionate), geraniol, hexenol, hexenyl acetate, hexyl acetate, hexyl formate, hydratropic alcohol, hydroxycitronellal, indone, isoamyl alcohol, iso menthone, isopulegyl acetate, isoquinolone, ligustral, linalool, linalool oxide, linalyl formate, menthone, menthyl acetphenone, methyl amyl ketone, methyl

anthranilate, methyl benzoate, methyl benyl acetate, methyl eugenol, methyl heptenone, methyl heptene carbonate, methyl heptyl ketone, methyl hexyl ketone, methyl phenyl carbonyl acetate, methyl salicylate, methyl-n-methyl anthranilate, nerol, octalactone, octyl alcohol, p-cresol, p-cresol methyl ether, p-methoxy acetophenone, p-methyl acetophenone, phenoxy ethanol, phenyl acetaldehyde, phenyl ethyl acetate, phenyl ethyl alcohol, phenyl ethyl dimethyl carbinol, prenyl acetate, propyl bornate, pulegone, rose oxide, safrole, 4-terpinenol, alpha-terpinenol, and /or viridine. It is commonplace for a plurality of perfume components to be present in a formulation. 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 from the list given of delayed blooming perfumes given above present in the perfume.

[0070] Another group of perfumes with which the present invention can be applied are the so-called 'aromatherapy' materials. These include many components also used in perfumery, including components of essential oils such as Clary Sage, Eucalyptus, Geranium, Lavender, Mace Extract, Neroli, Nutmeg, Spearmint, Sweet Violet Leaf and Valerian. It is preferred that the laundry treatment composition does not contain a peroxygen bleach, e.g., sodium percarbonate, sodium perborate, and peracid.

Fluorescent Agent

[0071] One or more fluorescent agents may be present as whole or part of the active ingredient of the laundry cleaning composition.

[0072] 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.

[0073] 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.

[0074] Preferred fluorescers are: sodium 2 (4-styryl-3-sulphophenyl)-2H-naphthol[1,2-d]triazole, disodium 4,4'-bis{[(4-anilino-6-(N methyl-N-2 hydroxyethyl) amino 1,3,5-triazin-2-yl)]amino}stilbene-2-2' disulphonate, disodium 4,4'-bis{[(4-anilino-6-morpholino-1,3,5-triazin-2-yl)]amino} stilbene-2-2' disulphonate, and disodium 4,4'-bis(2-sulphostyryl)biphenyl.

[0075] The total amount of the fluorescent agent or agents used in the composition is preferably from 0.0001 to 0.5 wt.%, more preferably 0.005 to 2 wt.%, most preferably 0.05 to 0.25 wt.%.

[0076] The aqueous solution used in the method preferably has a fluorescer present. The fluorescer is preferably present in the aqueous solution used in the method in the range from 0.0001 g/l to 0.1 g/l, more preferably 0.001 to 0.02 g/l.

Enzymes

[0077] Enzymes may be present as whole or part of the active ingredient of the laundry cleaning composition.

[0078] One or more enzymes are preferably present in the laundry composition of the invention and when practicing a method of the invention.

[0079] If present, then the level of each enzyme in the laundry composition of the invention is from 0.0001 wt.% to 0.1 wt.%.

[0080] Levels of enzyme present in the composition preferably relate to the level of enzyme as pure protein.

[0081] Contemplated enzymes include proteases, alpha-amylases, cellulases, lipases, peroxidases/oxidases, pectate lyases, and mannanases, or mixtures thereof.

[0082] Preferably the enzyme is selected from: proteases, alpha-amylases; cellulases and lipases.

[0083] Suitable lipases include those of bacterial or fungal origin. Chemically modified or protein engineered mutants are included. Examples of useful lipases include lipases from *Humicola* (synonym *Thermomyces*), e.g. from *H. lanuginosa* (*T. lanuginosus*) as described in EP 258 068 and EP 305 216 or from *H. insolens* as described in WO 96/13580, a *Pseudomonas* lipase, e.g. from *P. alcaligenes* or *P. pseudoalcaligenes* (EP 218 272), *P. cepacia* (EP 331 376), *P. stutzeri* (GB 1,372,034), *P. fluorescens*, *Pseudomonas* sp. strain SD 705 (WO 95/06720 and WO 96/27002), *P. wisconsinensis* (WO 96/12012), a *Bacillus* lipase, e.g. from *B. subtilis* (Dartois et al. (1993), Biochemica et Biophysica Acta, 1131, 253-360), *B. stearothermophilus* (JP 64/744992) or *B. pumilus* (WO 91/16422). Other examples are lipase variants such as those described in WO 92/05249, WO 94/01541, EP 407 225, EP 260 105, WO 95/35381, WO 96/00292, WO 95/30744, WO 94/25578, WO 95/14783, WO 95/22615, WO 97/04079 and WO 97/07202, WO 00/60063.

[0084] Preferred commercially available lipase enzymes include Lipolase™ and Lipolase Ultra™, Lipex™ and Lipoclean™ (Novozymes A/S).

[0085] The method of the invention may be carried out in the presence of phospholipase classified as EC 3.1.1.4 and/or EC 3.1.1.32. As used herein, the term phospholipase is an enzyme which has activity towards phospholipids.

[0086] Phospholipids, such as lecithin or phosphatidylcholine, consist of glycerol esterified with two fatty acids in an

outer (sn-1) and the middle (sn-2) positions and esterified with phosphoric acid in the third position; the phosphoric acid, in turn, may be esterified to an amino-alcohol. Phospholipases are enzymes which participate in the hydrolysis of phospholipids. Several types of phospholipase activity can be distinguished, including phospholipases A₁ and A₂ which hydrolyze one fatty acyl group (in the sn-1 and sn-2 position, respectively) to form lysophospholipid; and lysophospholipase (or phospholipase B) which can hydrolyze the remaining fatty acyl group in lysophospholipid. Phospholipase C and phospholipase D (phosphodiesterases) release diacyl glycerol or phosphatidic acid respectively.

[0087] Protease enzymes hydrolyse bonds within peptides and proteins, in the laundry context this leads to enhanced removal of protein or peptide containing stains. Examples of suitable proteases families include aspartic proteases; cysteine proteases; glutamic proteases; asparagine peptide lyase; serine proteases and threonine proteases. Such protease families are described in the MEROPS peptidase database (<http://merops.sanger.ac.uk/>). Serine proteases are preferred. Subtilase type serine proteases are more preferred. The term "subtilases" refers to a sub-group of serine protease according to Siezen et al., Protein Engng. 4 (1991) 719-737 and Siezen et al. Protein Science 6 (1997) 501-523. Serine proteases are a subgroup of proteases characterized by having a serine in the active site, which forms a covalent adduct with the substrate. The subtilases may be divided into 6 sub-divisions, i.e. the Subtilisin family, the Thermitase family, the Proteinase K family, the Lantibiotic peptidase family, the Kexin family and the Pyrolysin family.

[0088] Examples of subtilases are those derived from Bacillus such as Bacillus lentus, B. alkalophilus, B. subtilis, B. amyloliquefaciens, Bacillus pumilus and Bacillus gibsonii described in; US7262042 and WO09/021867, and subtilisin lentus, subtilisin Novo, subtilisin Carlsberg, Bacillus licheniformis, subtilisin BPN', subtilisin 309, subtilisin 147 and subtilisin 168 described in WO 89/06279 and protease PD138 described in (WO 93/18140). Other useful proteases may be those described in WO 92/175177, WO 01/016285, WO 02/026024 and WO 02/016547. Examples of trypsin-like proteases are trypsin (e.g. of porcine or bovine origin) and the Fusarium protease described in WO 89/06270, WO 94/25583 and WO 05/040372, and the chymotrypsin proteases derived from Cellulomonas described in WO 05/052161 and WO 05/052146.

[0089] Most preferably the protease is a subtilisins (EC 3.4.21.62).

[0090] Examples of subtilases are those derived from Bacillus such as Bacillus lentus, B. alkalophilus, B. subtilis, B. amyloliquefaciens, Bacillus pumilus and Bacillus gibsonii described in; US7262042 and WO09/021867, and subtilisin lentus, subtilisin Novo, subtilisin Carlsberg, Bacillus licheniformis, subtilisin BPN', subtilisin 309, subtilisin 147 and subtilisin 168 described in WO89/06279 and protease PD138 described in (WO93/18140). Preferably the subtilisin is derived from Bacillus, preferably Bacillus lentus, B. alkalophilus, B. subtilis, B. amyloliquefaciens, Bacillus pumilus and Bacillus gibsonii as described in US 6,312,936 B1, US 5,679,630, US 4,760,025, US7,262,042 and WO 09/021867. Most preferably the subtilisin is derived from Bacillus gibsonii or Bacillus Lentus.

[0091] Suitable commercially available protease enzymes include those sold under the trade names names Alcalase[®], Blaze[®], Duralase[™], Durazym[™], Relase[®], Relase[®] Ultra, Savinase[®], Savinase[®] Ultra, Primase[®], Polarzyme[®], Kan-nase[®], Liquanase[®], Liquanase[®] Ultra, Ovozyme[®], Coronase[®], Coronase[®] Ultra, Neutrase[®], Everlase[®] and Esperase[®] all could be sold as Ultra[®] or Evity[®] (Novozymes A/S).

[0092] The invention may be use cutinase, classified in EC 3.1.1.74. The cutinase used according to the invention may be of any origin. Preferably cutinases are of microbial origin, in particular of bacterial, of fungal or of yeast origin.

[0093] Suitable amylases (alpha and/or beta) include those of bacterial or fungal origin. Chemically modified or protein engineered mutants are included. Amylases include, for example, alpha-amylases obtained from *Bacillus*, e.g. a special strain of *B. licheniformis*, described in more detail in GB 1,296,839, or the *Bacillus* sp. strains disclosed in WO 95/026397 or WO 00/060060. Commercially available amylases are Duramyl[™], Termamyl[™], Termamyl Ultra[™], Natalase[™], Stainzyme[™], Fungamyl[™] and BAN[™] (Novozymes A/S), Rapidase[™] and Purastar[™] (from Genencor International Inc.).

[0094] Suitable cellulases include those of bacterial or fungal origin. Chemically modified or protein engineered mutants are included. Suitable cellulases include cellulases from the genera *Bacillus*, *Pseudomonas*, *Humicola*, *Fusarium*, *Thielavia*, *Acremonium*, e.g. the fungal cellulases produced from *Humicola insolens*, *Thielavia terrestris*, *Myceliophthora thermophila*, and *Fusarium oxysporum* disclosed in US 4,435,307, US 5,648,263, US 5,691,178, US 5,776,757, WO 89/09259, WO 96/029397, and WO 98/012307. Commercially available cellulases include Celluzyme[™], Carezyme[™], Celluclean[™], Endolase[™], Renozyme[™] (Novozymes A/S), Clazinase[™] and Puradax HA[™] (Genencor International Inc.), and KAC-500(B)[™] (Kao Corporation). Celluclean[™] is preferred.

[0095] Suitable peroxidases/oxidases include those of plant, bacterial or fungal origin. Chemically modified or protein engineered mutants are included. Examples of useful peroxidases include peroxidases from *Coprinus*, e.g. from *C. cinereus*, and variants thereof as those described in WO 93/24618, WO 95/10602, and WO 98/15257. Commercially available peroxidases include Guardzyme[™] and Novozym[™] 51004 (Novozymes A/S).

[0096] Further enzymes suitable for use are discussed in WO 2009/087524, WO 2009/090576, WO 2009/107091, WO 2009/111258 and WO 2009/148983.

[0097] The aqueous solution used in the method preferably has an enzyme present. The enzyme is preferably present in the aqueous solution used in the method at a concentration in the range from 0.01 to 10ppm, preferably 0.05 to 1ppm.

Enzyme Stabilizers

5 [0098] Any enzyme present in the composition may be stabilized using conventional stabilizing agents, e.g., a polyol such as propylene glycol or glycerol, a sugar or sugar alcohol, lactic acid, boric acid, or a boric acid derivative, e.g., an aromatic borate ester, or a phenyl boronic acid derivative such as 4-formylphenyl boronic acid, and the composition may be formulated as described in e.g. WO 92/19709 and WO 92/19708.

Builders or Complexing Agents

10 [0099] Builder materials may be present. If present then they are generally selected from 1) calcium sequestrant materials, 2) precipitating materials, 3) calcium ion-exchange materials and 4) mixtures thereof.

[0100] Examples of calcium sequestrant builder materials include alkali metal polyphosphates, such as sodium triphosphate and organic sequestrants, such as ethylene diamine tetra-acetic acid.

[0101] Examples of precipitating builder materials include sodium orthophosphate and sodium carbonate.

15 [0102] Examples of calcium ion-exchange builder materials include the various types of water-insoluble crystalline or amorphous aluminosilicates, of which zeolites are well 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.

[0103] The composition may also contain 0-65 % 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.

20 [0104] Preferably the laundry cleaning formulation is a non-phosphate built laundry detergent formulation, i.e., contains less than 1 wt.% of phosphate.

[0105] The laundry cleaning formulation is most preferably an aqueous liquid laundry detergent.

[0106] In the aqueous liquid laundry detergent it is preferred that mono propylene glycol is present at a level from 1 to 30 wt.%, most preferably 2 to 18 wt.%.

Polymers

30 [0107] The composition may preferably comprise one or more polymers. Example polymers are carboxymethylcellulose, poly(ethylene glycol), poly(vinyl alcohol), polycarboxylates such as polyacrylates, maleic/acrylic acid copolymers and lauryl methacrylate/acrylic acid copolymers.

[0108] Polymers present to prevent dye deposition may be present, for example poly(vinylpyrrolidone), poly(vinylpyridine-N-oxide), and poly(vinylimidazole).

Shading Dye

35 [0109] Dyes are described in Color Chemistry Synthesis, Properties and Applications of Organic Dyes and Pigments, (H Zollinger, Wiley VCH, Zürich, 2003) and, Industrial Dyes Chemistry, Properties Applications. (K Hunger (ed), Wiley-VCH Weinheim 2003).

40 [0110] Shading Dyes for use in laundry compositions preferably have an extinction coefficient at the maximum absorption in the visible range (400 to 700nm) of greater than 5000 L mol⁻¹ cm⁻¹, preferably greater than 10000 L mol⁻¹ cm⁻¹. The dyes are blue or violet in colour.

[0111] Preferably the composition comprises a shading dye. Preferably the shading dye is present at from 0.0001 to 0.1 wt.% of the composition.

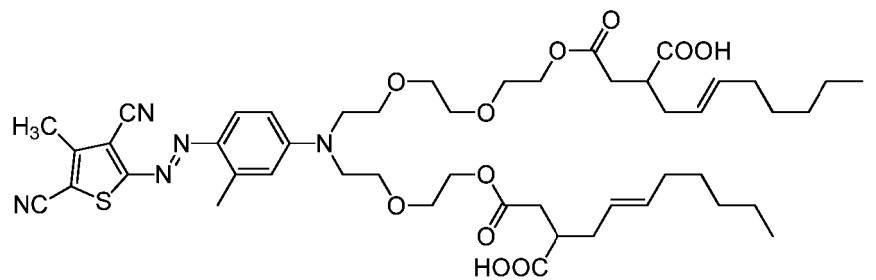
45 [0112] Preferred shading dye chromophores are azo, azine, anthraquinone, and triphenylmethane.

[0113] Azo, anthraquinone, phthalocyanine and triphenylmethane dyes preferably carry a net anionic charge or are uncharged. Azine preferably carry a net anionic or cationic charge. Blue or violet shading dyes deposit to fabric during the wash or rinse step of the washing process providing a visible hue to the fabric. In this regard the dye gives a blue or violet colour to a white cloth with a hue angle of 240 to 345, more preferably 250 to 320, most preferably 250 to 280. The white cloth used in this test is bleached non-mercerised woven cotton sheeting.

50 [0114] Shading dyes are discussed in WO 2005/003274, WO 2006/032327(Unilever), WO 2006/032397(Unilever), WO 2006/045275(Unilever), WO 2006/027086(Unilever), WO 2008/017570(Unilever), WO 2008/141880 (Unilever), WO 2009/132870(Unilever), WO 2009/141173 (Unilever), WO 2010/099997(Unilever), WO 2010/102861(Unilever), WO 2010/148624(Unilever), WO 2008/087497 (P&G), WO 2011/011799 (P&G), WO 2012/054820 (P&G), WO 2013/142495 (P&G) and WO 2013/151970 (P&G).

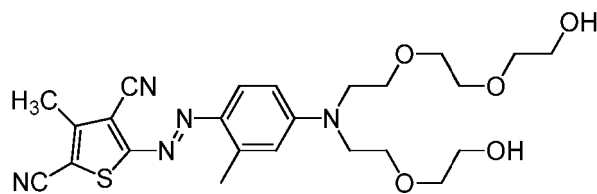
55 [0115] Mono-azo dyes preferably contain a heterocyclic ring and are most preferably thiophene dyes. The mono-azo dyes are preferably alkoxyated and are preferably uncharged or anionically charged at pH=7. Alkoxyated thiophene dyes are discussed in WO/2013/142495 and WO/2008/087497. Preferred examples of thiophene dyes are shown below:

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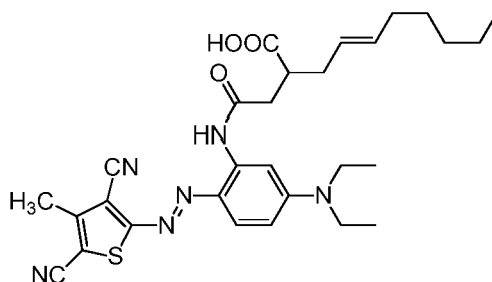
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20 and,

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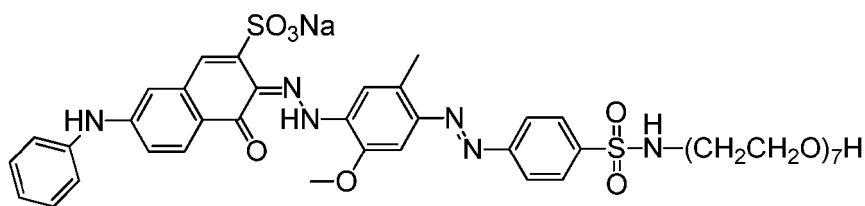
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[0116] Bis-azo dyes are preferably sulphonated bis-azo dyes. Preferred examples of sulphonated bis-azo compounds are direct violet 7, direct violet 9, direct violet 11, direct violet 26, direct violet 31, direct violet 35, direct violet 40, direct violet 41, direct violet 51, Direct Violet 66, direct violet 99 and alkoxyated versions thereof. Alkoxyated bis-azo dyes are discussed in WO2012/054058 and WO2010/151906.

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[0117] An example of an alkoxyated bis-azo dye is :

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[0118] Thiophene dyes are available from Milliken under the tradenames of Liquitint Violet DD and Liquitint Violet ION.

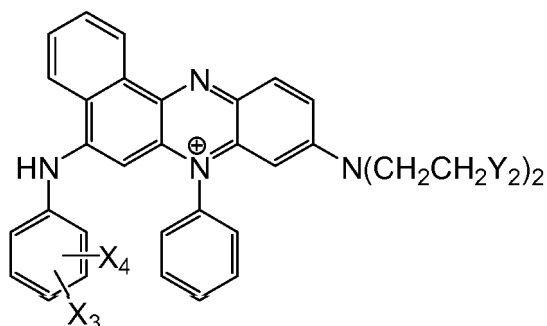
[0119] Azine dyes are preferably selected from sulphonated phenazine dyes and cationic phenazine dyes. Preferred examples are acid blue 98, acid violet 50, dye with CAS-No 72749-80-5, acid blue 59, and the phenazine dye selected from:

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wherein:

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X_3 is selected from: -H; -F; -CH₃; -C₂H₅; -OCH₃; and, -OC₂H₅;

X_4 is selected from: -H; -CH₃; -C₂H₅; -OCH₃; and, -OC₂H₅;

Y_2 is selected from: -OH; -OCH₂CH₂OH; -CH(OH)CH₂OH; -OC(O)CH₃; and, C(O)OCH₃.

20

[0120] The shading dye is present in the composition in range from 0.0001 to 0.5 wt %, preferably 0.001 to 0.1 wt%. Depending upon the nature of the shading dye there are preferred ranges depending upon the efficacy of the shading dye which is dependent on class and particular efficacy within any particular class. As stated above the shading dye is a blue or violet shading dye.

[0121] A mixture of shading dyes may be used.

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[0122] The shading dye is most preferably a reactive blue anthraquinone dye covalently linked to an alkoxyated polyethyleneimine. The alkoxylation is preferably selected from ethoxylation and propoxylation, most preferably propoxylation. Preferably 80 to 95 mol% of the N-H groups in the polyethylene imine are replaced with iso-propyl alcohol groups by propoxylation. Preferably the polyethylene imine before reaction with the dye and the propoxylation has a molecular weight of 600 to 1800.

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[0123] An example structure of a preferred reactive anthraquinone covalently attached to a propoxylated polyethylene imine is:

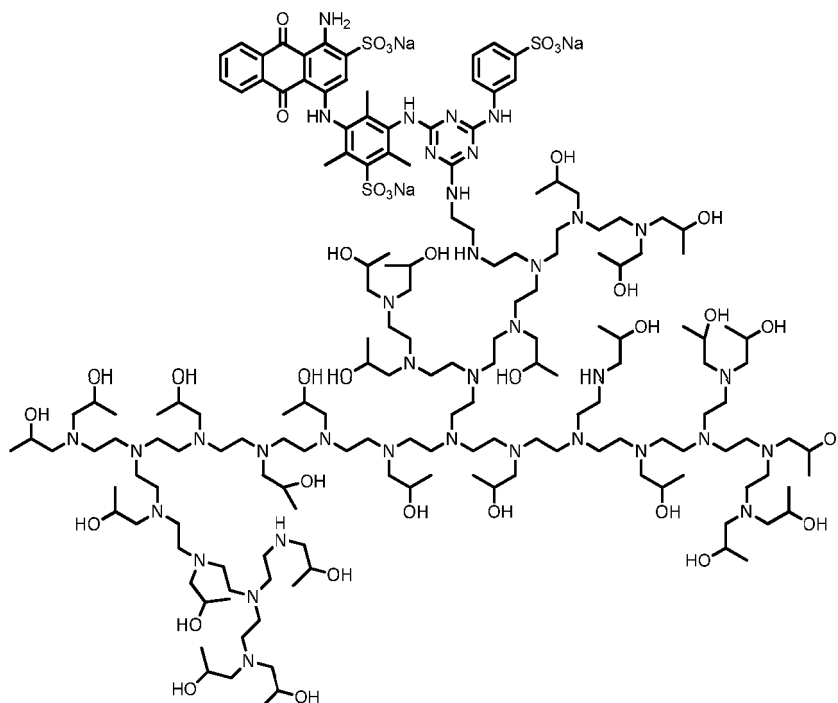
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(Structure I).

Misc

[0124] Where alkyl groups are sufficiently long to form branched or cyclic chains, the alkyl groups encompass branched, cyclic and linear alkyl chains. The alkyl groups are preferably linear or branched, most preferably linear.

[0125] The indefinite article "a" or "an" and its corresponding definite article "the" as used herein means at least one, or one or more, unless specified otherwise.

Experimental

[0126] The examples below are intended to illustrate the invention in detail without, however, limiting it thereto.

[0127] Trimellitic acid, trimellitic anhydride, pyromellitic acid, phenoxyethanol, methanesulfonic acid, pTsOH, Titanium isopropoxide, 4-Dodecylbenzenesulfonic acid mixture of isomers and benzyl alcohol were used as purchased from Sigma Aldrich.

[0128] Lauryl myristyl alcohol and cetearyl alcohol were used in technical grade quality and their molecular masses were determined prior to use by measuring the hydroxyl value (OH-value) and subsequently calculating the molecular weight (per hydroxyl function, "Gebrauchsmol"). In this case the OH-value may be measured according to DIN 53240.

[0129] The acid number (acid value) may be measured according to DIN EN ISO 2114.

[0130] The degree of alkoxylation of the used amine alkoxyates may be checked using NMR spectroscopy, for example using ¹H-NMR spectroscopy in analogy to the method described in R. Stevanova, D. Rankoff, S. Panayotova, S.L. Spassov, J. Am. Oil Chem. Soc., 65, 1516-1518 (1988). For this purpose, the samples are derivatised by reacting them with trichloro acetyl isocyanate and measured as solutions in deuterated chloroform containing 1 weight-% (1 wt.-%) of tetramethyl silane as an internal standard.

[0131] The esterification reactions were controlled by determining the residual content of alcohol (e.g. benzyl alcohol, phenoxyethanol, lauryl myristyl alcohol and cetearyl alcohol) by GC-FID. Calibration was performed with pure starting materials. Gas chromatography (GC) was performed using a Hewlett Packard GC 6890 with autosampler, coupled with a flame-ionisation detector (FID).

[0132] For the quantification of benzyl alcohol, samples were separated on a 50 m x 0.2 mm, 0.33 μm film column. The column temperature was initially held at 50°C, then the temperature was raised to 175°C at a rate of 5°C per minute and from 175°C to 300°C at a rate of 25°C per minute. The injector temperature was maintained at 250°C and the injection volume was 1.0 μL in the split mode. Helium was used as a carrier gas with a constant pressure of 1.8 bar. The samples were prepared by diluting 500 mg of sample (duplicate analysis) with 5 ml of methanol.

[0133] For the quantification of phenoxyethanol, cetearyl alcohol and dodecanol, samples were separated on a 25 m x 0.32 mm, 0.52 μm film column. The column temperature was initially held at 50°C, then the temperature was raised to 250°C at a rate of 10°C per minute and held for 6.5 minutes. The injector temperature was maintained at 250°C and the injection volume was 1.0 μL in the split mode. Helium was used as a carrier gas with a constant pressure of 0.9 bar. The samples were prepared by diluting 500 mg of sample (duplicate analysis) with 5 ml of methanol.

[0134] Thin layer chromatography (TLC) was performed using TLC Silica Gel 60 F254 plates from Merck. The aromatic compounds were detected by UV light (254 and 366 nm simultaneously).

[0135] All examples, unless otherwise stated, were performed according to a standard procedure. All reagents and quantities are listed in Table I.

[0136] The amine alkoxyate of choice was heated to 80°C with stirring under nitrogen. The polycarboxylic acid or acid anhydride of choice was then added in portions over 5 minutes. The reaction mixture was then stirred for 2.5 hours at 80°C. The product, henceforth termed precursor, was isolated and the acid number determined - these are listed in Table I in the column AN1.

[0137] Some amount of the precursor (listed in the column "PC" of Table I) was mixed with the alcohol and catalyst of choice and heated to the temperature listed in Table I while stirring under nitrogen. The reaction mixture was stirred at the temperature listed for the time denoted in Table I and water was distilled off.

The abbreviations used in Table I are as follows:

[0138]

AA	amine alkoxyate
PCA	polycarboxylic acid
PC	precursor
BA	benzyl alcohol
PE	phenoxyethanol
C16/18	cetearyl alcohol

EP 3 649 221 B1

C12/14 lauryl myristyl alcohol
 AN1 acid number of the precursor
 AN2 acid number of the final product
 M41 amine-terminated methyl-ethoxylated-propoxylated polyether with an average molecular weight of 2000 g/mol, an average molar ratio of EO to PO of 4 to 1 with the EO and PO units distributed statistically
 TMAA trimellitic acid anhydride
 Cat Catalyst (pTsOH p-toluene sulfonic acid)

Table I: Example Dispersant Compositions

	1	2	3	4	5	C1
AA (g)	M41 470	M41 470	M41 1005	M41 1005	M41 1005	M41 470
PCA (g)	TMAA 42.71	TMAA 42.71	TMAA 91.36	TMAA 91.36	TMAA 91.36	TMAA 42.71
PC (g)	215.0	215.0	340.6	325.9	334.6	-
BA (g)	20.2	20.2	-	-	-	-
PE (g)	-	-	40.8	-	-	-
C16/C18 (g)	-	-	-	74.3	-	-
C12 (g)	-	-	-	-	54.0	-
Cat (g)	pTsOH 0.24	pTsOH 0.24	pTsOH 0.36	pTsOH 0.40	pTsOH 0.39	-
Temp (°C)	180	200	180	180	180	80
Time (hr)	43	43	40	42	42	2.5
AN1 (mg KOH per g)	48.7	48.7	48.6	48.6	48.6	48.7
AN2 (mg KOH per g)	14.0	8.5	15.1	8.9	9.2	-
Residual Alcohol (wt.%)	5.3	3.0	2.1	11.0	9.5	-

[0139] As a comparative example, sample C1 from Table I was isolated after the first synthesis step and no reaction with alcohol was performed.

[0140] An aqueous liquid laundry detergent of the following formulation was prepared:

Table II: Liquid laundry detergent formulation

Ingredient	weight-%
Mono propylene glycol	2.2
Triethanolamine	1.5
C ₁₂ -C ₁₅ alcohol ethoxylate with 7 moles of ethylene oxide	1.2
Linear alkyl benzene sulfonate	4.6
Sodium laureth ether sulphate with 1 moles of ethylene oxide	5.8
Citric acid	2.0
CaCl ₂ dihydrate	0.2
NaCl	0.2
Tinopal® CBS-X (fluorescer BASF)	0.3
Sodium Hydroxide	to pH = 8.4
Exemplary dispersants	see text

(continued)

Ingredient	weight-%
Water	balance

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Application Example 1 - Anti-Redeposition Benefit

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[0141] The formulation was used to wash eight 5x5 cm knitted cotton cloth pieces in a Tergotometer set at 200 rpm (revolutions per minute). A one hour wash was conducted in 800 ml of water with 26° French hardness at 20°C, with 2.3 g/l of the formulation shown in Table II. To simulate particulate soil that could redeposit, 0.04 g/l of 100% compressed carbon black (ex Alfa Aesar) was added to the wash liquor. To simulate oily sebaceous soil, 7.2 g of an SBL2004 soil strip (ex Warwick Equest) was added to the wash liquor.

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[0142] Once the wash had been completed, the cotton swatches were rinsed once in 400 ml clean water, removed, dried and the colour measured on a reflectometer and expressed as the CIE L*a*b* values. The anti-redeposition benefit was expressed as the ΔL value:

$$\Delta L = L^*(\text{dispersant}) - L^*(\text{control})$$

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[0143] The larger the ΔL value, the greater the prevention of deposition of the carbon black soil. 95% confidence limits based on the 8 separate cotton swatches were calculated.

[0144] Formulations were made with and without the addition of 8.7 wt.-% of the dispersants of Table I. The results are given in Table III.

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Table III: Anti-redeposition benefit

Exemplary dispersant	ΔL	95 %
Example 3	1.6	0.4
Example 4	3.6	0.2
Example 5	3.8	0.2
Example C1	0.3	0.1

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[0145] The alkoxyated dispersants reduces deposition of the carbon black soil significantly.

Claims

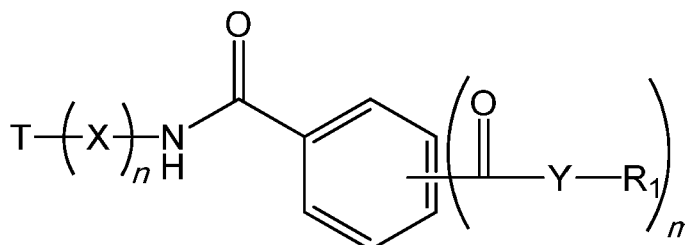
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1. A laundry cleaning composition comprising:

(i) from 0.2 to 20 wt.%, preferably 0.5 to 12 wt.%, more preferably 1 to 10 wt.% of an alkoxyated dispersant of the following structure:

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wherein:

X is selected from: ethoxy; and mixtures of ethoxy and propoxy groups, wherein the number of ethoxy groups is greater than the number of propoxy groups, and wherein n is from 6 to 70;

m is 2;

R₁ is selected from: branched and linear C8 to C20 alkyl chains, uncharged aryl groups; and, uncharged alkyl-aryl groups, wherein the alkyl group of the alkyl-aryl is a saturated linear or branched C1 to C3;

T is CH₃;

Y is selected from O;

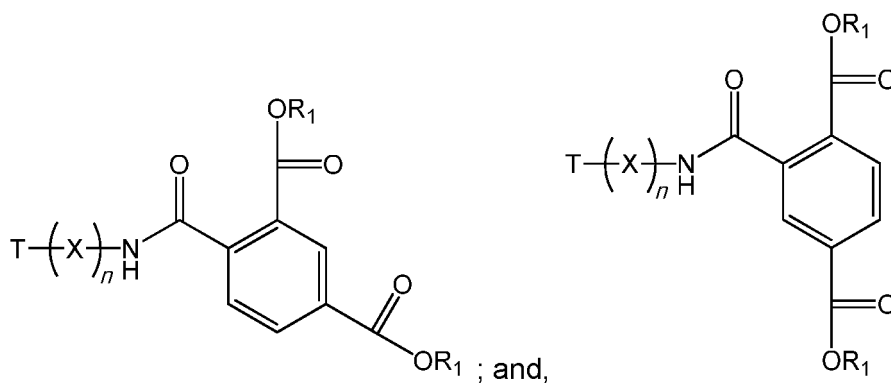
(ii) from 0 to 50 wt.% surfactant, other than the alkoxyated dispersant; and

(iii) an active ingredient selected from one or more of the following: from 0.001 to 3 wt.% perfume; from 0.0001 to 0.5 wt.% of fluorescent agent; and, from 0.0001 wt.% to 0.1 wt.% of an enzyme.

2. A laundry cleaning composition according to claim 1, wherein R₁ is selected from C12 to C18 linear alkyl chains; benzyl; and phenylethyl.

3. A laundry cleaning composition according to any one of the preceding claims, wherein n is from 6 to 40, preferably from 9 to 30, more preferably from 10 to 20.

4. A laundry cleaning composition according to any preceding claim, wherein the alkoxyated dispersant is selected from:



5. A laundry cleaning composition according to any one of the preceding claims, wherein the surfactant is present at a level of from 4 to 40 wt.%, preferably from 4 to 35 wt.%, more preferably from 6 to 30 wt.%, and the surfactant comprises anionic and/or non-ionic surfactants, preferably wherein the weight fraction of non-ionic surfactant to anionic surfactant is from 0 to 0.3, wherein the alkoxyated dispersant is not considered a surfactant as defined herein.

6. A laundry cleaning composition according to claim 5, wherein the anionic surfactant is selected from: linear alkyl benzene sulphonates; alkyl sulphates; alkyl ether sulphates; alkyl ether carboxylates and mixtures thereof.

7. A laundry cleaning composition according to claim 5 or claim 6, comprising a non-ionic surfactant, wherein the non-ionic surfactant is an alcohol ethoxylate, preferably an C₁₀-C₁₈ alcohol ethoxylate having an average of 3-10 moles of ethylene oxide, more preferably an C₁₂-C₁₅ alcohol ethoxylate having an average of 5-9 moles of ethylene oxide.

8. A laundry cleaning composition according to any one of the preceding claims, wherein the composition is an aqueous liquid detergent composition having a pH from 6 to 8.5, preferably from 6.5 to 7.5, more preferably from 6.8 to 7.2, most preferably 7.0.

9. A laundry cleaning composition according to any preceding claim, wherein the active ingredient is an enzyme and comprises one or more of the following: proteases, alpha-amylases, cellulases, lipases, peroxidases/oxidases, pectate lyases, and mannanases, or mixtures thereof, preferably the enzyme is a protease, more preferably a subtilase type serine protease.

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

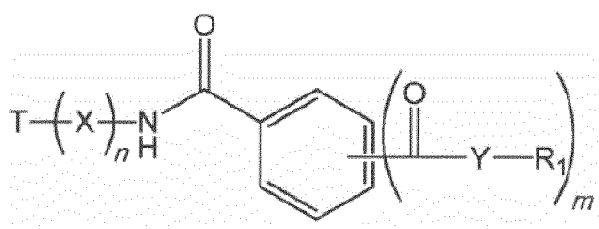
(i) treating a textile with an aqueous solution of the alkoxyated dispersant as defined in any one of claims 1 to 4; the aqueous solution comprising from 10 ppm to 5000 ppm, preferably from 100 ppm to 1000 ppm of the alkoxyated dispersant; and, from 0 to 6 g/L, preferably from 0.5 to 6 g/L, more preferably from 1 to 5 g/L of a

surfactant, other than the alkoxyated dispersant; and,
 (ii) optionally rinsing and drying the textile;
 wherein in the method one or more of an active ingredient selected from perfume, fluorescent agent and enzyme
 is present in the aqueous solution of the alkoxyated dispersant,
 wherein if present, the level of the perfume in the aqueous solution is from 0.1 to 100 ppm;
 wherein if present, the level of the fluorescent agent in the aqueous solution is from 0.0001 g/l to 0.1 g/L,
 preferably from 0.001 to 0.02 g/L; and,
 wherein if present, the level of the enzyme in the aqueous solution is from 0.01 to 10ppm, preferably 0.05 to 1ppm.

Patentansprüche

1. Wäschereinigungszusammensetzung, umfassend:

(i) 0,2 bis 20 Gew.-%, vorzugsweise 0,5 bis 12 Gew.-%, bevorzugter 1 bis 10 Gew.-% eines alkoxylierten Dispergiermittels der folgenden Struktur:



worin:

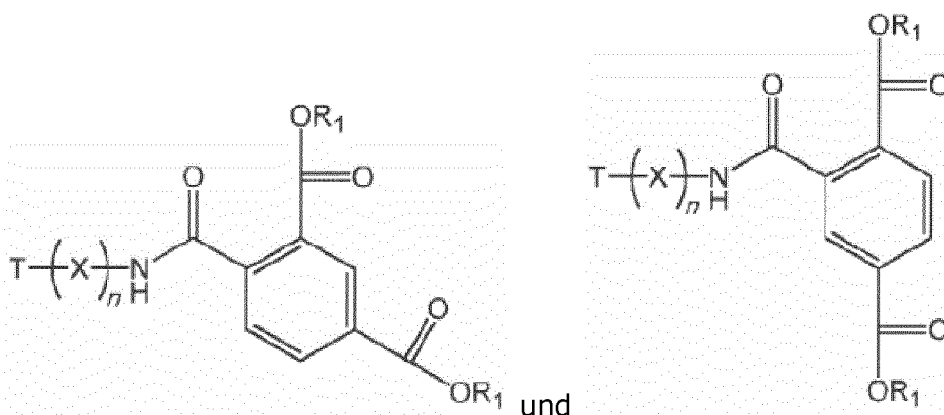
X ausgewählt ist aus: Ethoxy- und Mischungen von Ethoxy- und Propoxygruppen, wobei die Zahl der Ethoxygruppen größer als die Zahl der Propoxygruppen ist und worin n 6 bis 70 ist;
 m 2 ist;
 R₁ ausgewählt ist aus: verzweigten und linearen C₈- bis C₂₀-Alkylketten, ungeladenen Arylgruppen und ungeladenen Alkyl-Arylgruppen, wobei die Alkylgruppe der Alkyl-Aryl-Gruppen eine gesättigte lineare oder verzweigte C₁- bis C₈-Gruppe ist;
 T CH₃ ist;
 Y ausgewählt ist aus O;

(ii) 0 bis 50 Gew.-% Tensid, mit Ausnahme des alkoxylierten Dispergiermittels, und
 (iii) einen aktiven Bestandteil, ausgewählt aus einem oder mehreren Bestandteilen von: 0,001 bis 3 Gew.-% Parfüm; 0,0001 bis 0,5 Gew.-% Fluoreszenzmittel und 0,0001 Gew.-% bis 0,1 Gew.-% eines Enzyms.

2. Wäschereinigungszusammensetzung nach Anspruch 1, wobei R₁ aus linearen C₁₂- bis C₁₈-Alkylketten, Benzyl und Phenylethyl ausgewählt ist.

3. Wäschereinigungszusammensetzung nach irgendeinem der vorhergehenden Ansprüche, wobei n 6 bis 40, vorzugsweise 9 bis 30, bevorzugter 10 bis 20 ist.

4. Wäschereinigungszusammensetzung nach einem vorhergehenden Anspruch, wobei das alkoxylierte Dispergiermittel ausgewählt ist aus:

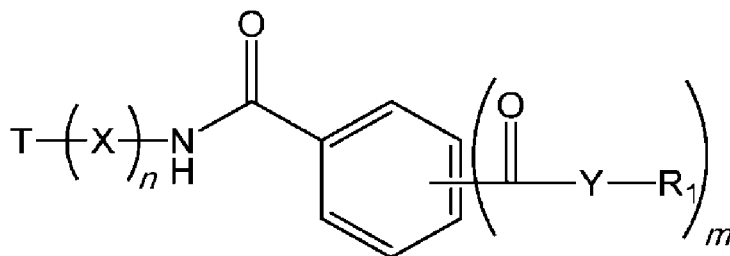


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5. Wäschereinigungszusammensetzung nach irgendeinem der vorhergehenden Ansprüche, wobei das Tensid in einer Menge von 4 bis 40 Gew.-%, vorzugsweise von 4 bis 35 Gew.-%, bevorzugter von 6 bis 30 Gew.-%, vorliegt und das Tensid anionische und/oder nicht-ionische Tenside umfasst, wobei der Gewichtsanteil des nicht-ionischen Tensids zum anionischen Tensid vorzugsweise 0 bis 0,3 beträgt, wobei das alkoxylierte Dispergiermittel nicht als Tensid, wie hier definiert, gilt.
 6. Wäschereinigungszusammensetzung nach Anspruch 5, wobei das anionische Tensid aus linearen Alkylbenzolsulfonaten, Alkylsulfaten, Alkylethersulfaten, Alkylethercarboxylaten und Mischungen davon ausgewählt ist.
 7. Wäschereinigungszusammensetzung nach Anspruch 5 oder Anspruch 6, umfassend nicht-ionisches Tensid, wobei das nicht-ionische Tensid ein Alkoholethoxylat, vorzugsweise ein C₁₀-C₁₈-Alkoholethoxylat mit durchschnittlich 3-10 Mol Ethylenoxid, bevorzugter ein C₁₂-C₁₅-Alkoholethoxylat mit durchschnittlich 5-9 Mol Ethylenoxid ist.
 8. Wäschereinigungszusammensetzung nach irgendeinem der vorhergehenden Ansprüche, wobei die Zusammensetzung eine flüssige wässrige Reinigungszusammensetzung mit einem pH-Wert von 6 bis 8,5, vorzugsweise von 6,5 bis 7,5, bevorzugter von 6,8 bis 7,2, höchst bevorzugter von 7,0 ist.
 9. Wäschereinigungszusammensetzung nach einem vorhergehenden Anspruch, wobei der aktive Bestandteil ein Enzym ist und ein oder mehrere der folgenden Enzyme umfasst: Proteasen, alpha-Amylasen, Cellulasen, Lipasen, Peroxidasen/Oxidasen, Pektatlyasen und Mannanasen oder Mischungen davon, wobei das Enzym vorzugsweise eine Protease, bevorzugter eine Serinprotease vom Subtilase-Typ ist.
 10. Häusliches Verfahren zur Behandlung eines Textils, wobei das Verfahren die Schritte umfasst:
 - (i) Behandlung eines Textils mit einer wässrigen Lösung des alkoxylierten Dispergiermittels, wie in irgendeinem der Ansprüche 1 bis 4 definiert, wobei die wässrige Lösung 10 ppm bis 5000 ppm, vorzugsweise 100 ppm bis 1000 ppm des alkoxylierten Dispergiermittels und 0 bis 6 g/l, vorzugsweise 0,5 bis 6 g/l, bevorzugter 1 bis 5 g/l eines Tensids, mit Ausnahme des alkoxylierten Dispergiermittels, umfasst; und
 - (ii) gegebenenfalls Spülen und Trocknen des Textils;
 wobei bei dem Verfahren ein oder mehrere aktive Bestandteile, ausgewählt aus Parfüm, Fluoreszenzmittel und Enzym, in der wässrigen Lösung des alkoxylierten Dispergiermittels vorliegen, wobei, wenn vorhanden, die Menge des Parfüms in der wässrigen Lösung 0,1 bis 100 ppm beträgt; wobei, wenn vorhanden, die Menge des Fluoreszenzmittels in der wässrigen Lösung 0,0001 g/l bis 0,1 g/l, vorzugsweise 0,001 bis 0,02 g/l beträgt und wobei, wenn vorhanden, die Menge des Enzyms in der wässrigen Lösung 0,01 bis 10 ppm, vorzugsweise 0,05 bis 1 ppm, beträgt.

Revendications

- 55 1. Composition nettoyante pour le linge comprenant :

(i) 0,2 à 20 % en poids, de préférence 0,5 à 12 % en poids, mieux encore 1 à 10 % en poids d'un dispersant alcoylé de structure suivante :



dans laquelle :

X est choisi parmi : éthoxy ; et les mélanges de groupes éthoxy et propoxy, dans lesquels le nombre de groupes éthoxy est supérieur au nombre de groupes propoxy, et dans laquelle n vaut de 6 à 70 ;

m vaut 2 ;

R_1 est choisi parmi : les chaînes alkyle en C_8 à C_{20} ramifiées et linéaires, les groupes aryle non chargés ; et les groupes alkyl-aryle non chargés, dans lesquels le groupe alkyle de l'alkyl-aryle est en C_1 à C_3 , saturé, linéaire ou ramifié ;

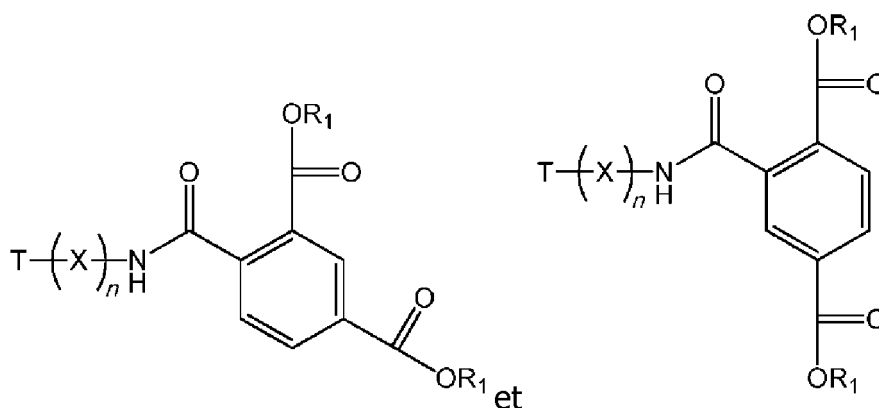
T est CH_3 ;

Y est choisi parmi O ;

(ii) 0 à 50 % en poids d'un tensioactif autre que le dispersant alcoylé ; et

(iii) un ingrédient actif choisi parmi un ou plusieurs des suivants : 0,001 à 3 % en poids de parfum ; 0,0001 à 0,5 % en poids d'agent fluorescent ; et 0,0001 % en poids à 0,1 % en poids d'une enzyme.

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2. Composition nettoyante pour le linge selon la revendication 1, dans laquelle R_1 est choisi parmi les chaînes alkyle linéaires en C_{12} à C_{18} ; benzyle ; et phényléthyle.
 3. Composition nettoyante pour le linge selon l'une quelconque des revendications précédentes, dans laquelle n vaut de 6 à 40, de préférence de 9 à 30, mieux encore de 10 à 20.
 4. Composition nettoyante pour le linge selon l'une quelconque des revendications précédentes, dans laquelle le dispersant alcoylé est choisi parmi :



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5. Composition nettoyante pour le linge selon l'une quelconque des revendications précédentes, dans laquelle le tensioactif est présent à raison de 4 à 40 % en poids, de préférence de 4 à 35 % en poids, mieux encore de 6 à 30 % en poids, et le tensioactif comprend des tensioactifs anioniques et/ou non-ioniques, de préférence dans laquelle le rapport en poids du tensioactif non-ionique au tensioactif anionique est de 0 à 0,3, dans laquelle le dispersant alcoylé n'est pas considéré comme un tensioactif tel que défini ici.
 6. Composition nettoyante pour le linge selon la revendication 5, dans laquelle le tensioactif anionique est choisi parmi : les alkylbenzènesulfonates linéaires ; les alkylsulfates ; les alkyléthersulfates ; les alkyléthercarboxylates et leurs mélanges.
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7. Composition nettoyante pour le linge selon la revendication 5 ou la revendication 6, comprenant un tensioactif non-ionique, dans laquelle le tensioactif non-ionique est un alcool éthoxylé, de préférence un alcool éthoxylé en C₁₀ à C₁₈ ayant en moyenne 3 à 10 moles d'oxyde d'éthylène, mieux encore un alcool éthoxylé en C₁₂ à C₁₅ ayant en moyenne 5 à 9 moles d'oxyde d'éthylène.
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8. Composition nettoyante pour le linge selon l'une quelconque des revendications précédentes, laquelle composition est une composition détergente liquide aqueuse ayant un pH de 6 à 8,5, de préférence de 6,5 à 7,5, mieux encore de 6,8 à 7,2, tout spécialement de 7,0.
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9. Composition nettoyante pour le linge selon l'une quelconque des revendications précédentes, dans laquelle l'ingrédient actif est une enzyme et comprend une ou plusieurs des suivantes : protéases, alpha-amylases, cellulases, lipases, peroxydases/oxydases, pectate lyases, et mannanases, ou leurs mélanges, de préférence l'enzyme est une protéase, mieux encore une sérine protéase de type subtilase.
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10. Procédé domestique de traitement d'un textile, le procédé comprenant les étapes de :
- (i) traitement d'un textile avec une solution aqueuse du dispersant alcoxylé tel que défini dans l'une quelconque des revendications 1 à 4 ;
la solution aqueuse comprenant 10 ppm à 5000 ppm, de préférence 100 ppm à 1000 ppm du dispersant alcoxylé ; et 0 à 6 g/L, de préférence 0,5 à 6 g/L, mieux encore 1 à 5 g/L d'un tensioactif autre que le dispersant alcoxylé ; et
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- (ii) éventuellement rinçage et séchage du textile ;
procédé dans lequel un ou plusieurs ingrédients actifs choisis parmi un parfum, un agent fluorescent et une enzyme sont présents dans la solution aqueuse du dispersant alcoxylé,
dans lequel, s'il est présent, le niveau du parfum dans la solution aqueuse est de 0,1 à 100 ppm ;
dans lequel, s'il est présent, le niveau de l'agent fluorescent dans la solution aqueuse est de 0,0001 g/L à 0,1 g/L, de préférence de 0,001 à 0,02 g/L ; et
dans lequel, si elle est présente, le niveau de l'enzyme dans la solution aqueuse est de 0,01 à 10 ppm, de préférence de 0,05 à 1 ppm.
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