(19) Europäisches Patentamt
European Patent Office
Office européen des brevets

(11) **EP 3 884 026 B1**

(12) **EUROPEAN PATENT SPECIFICATION**

(45) Date of publication and mention of the grant of the patent:
26.06.2024 Bulletin 2024/26

(21) Application number: **19798035.2**

(22) Date of filing: **30.10.2019**

(51) International Patent Classification (IPC):
C11D 3/386 *(2006.01)* ***C11D 11/00*** *(2006.01)*

(52) Cooperative Patent Classification (CPC):
C11D 3/38627; C11D 2111/12

(86) International application number:
PCT/EP2019/079658

(87) International publication number:
WO 2020/104159 (28.05.2020 Gazette 2020/22)

(54) **DETERGENT COMPOSITION**

REINIGUNGSMITTELZUSAMMENSETZUNG

COMPOSITION DE DÉTERGENT

(84) Designated Contracting States:
AL AT BE BG CH CY CZ DE DK EE ES FI FR GB GR HR HU IE IS IT LI LT LU LV MC MK MT NL NO PL PT RO RS SE SI SK SM TR

(30) Priority: **20.11.2018 EP 18207278**

(43) Date of publication of application:
29.09.2021 Bulletin 2021/39

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Remarks:

The complete document including Reference Table(s) and the Sequence Listing(s) can be downloaded from the EPO website

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Description

Field of Invention

[0001] The invention concerns a detergent composition, more specifically a laundry detergent composition, said composition comprising a novel lipase enzyme.

Background of the Invention

[0002] Sebum is an oily soil which has remained a difficult stain to remove from worn garments. With a drive to encourage consumers to wash at lower temperatures, the challenge for effective removal of sebum remains demanding. Sebum consists of a number of fats and esters including wax esters, cholesterol esters, squalene and many free fatty acids/ alcohols. Sebum is liquid at body temperature, but solid at ambient temperature.

[0003] These properties are particularly important for collar/cuff soil removal because it is easier to remove a liquid body oil than solids from clothes. Current laundry enzymes are not able to degrade all the components of the sebum which makes removal from fabric difficult. EP3299457 A1 discloses washing and cleaning compositions that comprise lipases.

[0004] There is a problem with sebum removal in that detergents including current commercial enzymes do not remove sebum adequately.

Summary of the Invention

[0005] We have found that the incorporation of a novel lipase enzyme in detergent compositions improve the sebum removal from fabrics.

[0006] In one aspect the present invention provides a detergent composition comprising:

(i) from 1 to 60 wt.%, preferably from 2 to 50 wt.%, more preferably from 3 to 45 wt.%, even more preferably from 5 to 40 wt.%, most preferably from 6 to 40 wt.% of a surfactant; and,
(ii) from 0.0005 to 5 wt.%, preferably from 0.005 to 2.5 wt.%, more preferably from 0.01 to 1 wt.% of a lipase enzyme having at least 60% sequence identity to SEQ ID NO: 1.

[0007] Preferably the lipase enzyme has at least 70%, more preferably at least 75%, more preferably at least 80%, more preferably at least 85%, even more preferably at least 90%, even more preferably at least 95%, most preferably at least 97%, at least 98% or even at least 99% sequence identity to SEQ ID NO: 1.

[0008] Most preferably the lipase enzyme has 100% sequence identity to SEQ ID NO: 1.

[0009] Preferably the detergent composition comprises from 0.1 to 10 wt.%, preferably from 0.2 to 9 wt.%, more preferably from 0.25 to 8, even more preferably from 0.5 to 6 wt.%, most preferably from 1 to 5 wt.% of a soil release polymer, more preferably a polyester based soil released polymer.

[0010] Preferably the polyester soil release polymer is a polyethylene and/or polypropylene terephthalate based soil release polymer, preferably a polypropylene terephthalate based soil release polymer.

[0011] Preferably the detergent composition comprises an alkoxylated polyamine, preferably at a level of from 0.1 to 8 wt.%, more preferably from 0.2 to 6 wt.%, most preferably from 0.5 to 5 wt.%.

[0012] Preferably the detergent composition is a laundry detergent composition. Preferably the laundry detergent composition is a liquid or a powder, most preferably a liquid detergent.

[0013] Preferably the surfactant in the detergent composition comprises anionic and/or nonionic surfactant, in one case comprising both anionic and nonionic surfactant.

[0014] Preferred detergent compositions, particularly laundry detergent compositions additionally comprise a further enzyme selected from the group consisting of: proteases, cellulases, alpha-amylases, peroxidases/oxidases, pectate lyases, and/or mannanases.

[0015] Preferred detergent compositions, particularly laundry detergent compositions additionally comprise a further ingredient selected from fluorescent agent, perfume, shading dyes and polymers, and mixtures thereof.

[0016] In another aspect the present invention provides a method of treatment of a fabric substrate with a sebum stain, said method comprising incorporation of a lipase enzyme having at least 60%, preferably at least 70%, more preferably at least 75%, more preferably at least 80%, more preferably at least 85%, even more preferably at least 90%, even more preferably at least 95%, most preferably at least 97%, at least 98% or even at least 99% sequence identity, most preferably 100%, sequence identity to SEQ ID NO: 1 into a detergent composition comprising from 1 to 60 wt.% of a surfactant; and subsequent treatment of a fabric substrate with a sebum stain, with said composition.

[0017] In another aspect the present invention provides the use of an enzyme having at least 60%, preferably at least

70%, more preferably at least 75%, more preferably at least 80%, more preferably at least 85%, even more preferably at least 90%, even more preferably at least 95%, most preferably at least 97%, at least 98% or even at least 99% sequence identity, most preferably 100%, sequence identity to SEQ ID NO: 1 to improve cleaning of sebum stains on fabric.

Detailed Description of the Invention

[0018] 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.

[0019] All % levels of ingredients in compositions (formulations) listed herein are in wt.% based on total formulation unless other stated.

[0020] It is understood that any reference to a preferred ingredient of the detergent composition is envisaged to be combinable subject matter with any other preferred ingredient of the detergent composition disclosed herein.

[0021] The detergent composition may take any suitable form, for example liquids, solids (including powders) or gels.

[0022] The detergent composition can be applied to any suitable substrate. Particularly preferred substrates are textiles. Particularly preferred detergent compositions are laundry detergent compositions.

[0023] Laundry detergent compositions may take any suitable form. Preferred forms are liquid or powder, with liquid being most preferred.

Sequence Information

[0024] The sequences disclosed herein is SEQ ID NO 1.
SEQ ID 1 is from *Vulcanisaeta moutnovskia*

[0025] The sequence is:

MPLDPAVGRVLEELNKVMPQMTKIPLSEFRKMFRAFFASQSRRSIYKVYDITIPGTEAKIPVR
IYVPREGTDLGILVYFHGGGFVLGDVETYDPLCRELAVACDCVVVSVDYRLAPEHKFPAAVI
DSFDSTKWVLEHAREINGDPEKVAVGGDSAGGNLAAVVAIMARDQGLKPSLKYQVLINPFV
GVDPASYTIREYSTGLFLEREAMAFFNKAYLRSPADAFDPRFSPILIDNLSNLPPALIITSEYD
PLRDSAETYAAKLAESGVPTIVVRFNGVTHGFYGFPIPHAKAAVGLIGTTLRQAFYGKY

Lipase enzyme

[0026] The lipase enzyme has at least 60% sequence identity to SEQ ID NO: 1.

[0027] Preferably the lipase enzyme has at least 70%, more preferably at least 75%, more preferably at least 80%, more preferably at least 85%, even more preferably at least 90%, even more preferably at least 95%, most preferably at least 97%, at least 98% or even at least 99% sequence identity to SEQ ID NO: 1.

[0028] Most preferably the lipase enzyme has 100% sequence identity to SEQ ID NO: 1.

[0029] The lipase can be described as being of enzyme class EC 3.1.1.3, known as triacyl glycerol lipase.

[0030] Preferred lipases are from *Vulcanisaeta moutnovskia.*

Surfactant

[0031] The detergent composition comprises surfactant (which may include a single surfactant or a mixture of two or more surfactants). The composition comprises from 1 to 60 wt.%, preferably from 2 to 50 wt.%, more preferably from 3 to 45 wt.%, even more preferably from 5 to 40 wt.%, most preferably from 6 to 40 wt.% of surfactant.

[0032] The detergent composition (preferably a laundry detergent composition) comprises anionic and/or nonionic surfactant, preferably comprising both anionic and nonionic surfactant.

[0033] 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.

[0034] 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.

[0035] The anionic surfactant is preferably selected from: linear alkyl benzene sulphonate; alkyl sulphates; alkyl ether sulphates; soaps; alkyl (preferably methyl) ester sulphonates, and mixtures thereof.

[0036] The most 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 C_{12}-C_{14} n-alkyl ether sulphate with an average of 1 to 3EO (ethoxylate) units.

[0037] Sodium lauryl ether sulphate is particularly preferred (SLES). Preferably the linear alkyl benzene sulphonate is a sodium C_{11} to C_{15} alkyl benzene sulphonates. Preferably the alkyl sulphates is a linear or branched sodium C_{12} to C_{18} alkyl sulphates. Sodium dodecyl sulphate is particularly preferred, (SDS, also known as primary alkyl sulphate).

[0038] In liquid formulations preferably two or more anionic surfactant are present, for example linear alkyl benzene sulphonate together with an alkyl ether sulphate.

[0039] In liquid formulations, preferably the laundry composition in addition to the anionic surfactant comprises alkyl exthoylated non-ionic surfactant, preferably from 2 to 8 wt.% of alkyl ethoxylated non-ionic surfactant.

[0040] 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. Preferred nonionic detergent compounds are the condensation products of aliphatic C_8 to C_{18} primary or secondary linear or branched alcohols with ethylene oxide.

[0041] Most preferably the nonionic detergent compound is the alkyl ethoxylated non-ionic surfactant is a C_8 to C_{18} primary alcohol with an average ethoxylation of 7EO to 9EO units.

[0042] Preferably the surfactants used are saturated.

Soil release polymer

[0043] The soil release polymer is preferably present at a level of from 0.1 to 10 wt.%. Preferred levels of inclusion of the soil release polymer are preferably from 0.2 to 9 wt.%, more preferably from 0.25 to 8 wt.%, even more preferably from 0.5 to 6 wt.%, most preferably from 1 to 5 wt.%.

[0044] Preferably the soil release polymer is a polyester based soil released polymer. More preferably the polyester soil release polymer is a polyethylene and/or polypropylene terephthalate based soil release polymer, most preferably a polypropylene terephthalate based soil release polymer.

[0045] Suitable polyester based soil release polymers are described in WO 2014/029479 and WO 2016/005338.

Alkoxylated polyamine

[0046] The detergent composition preferably comprises an alkoxylated polyamine. Especially when the detergent composition is in the form of a laundry composition, it is preferred that an alkoxylated polyamine is included.

[0047] Preferred levels of alkoxylated polyamine range from 0.1 to 8 wt.%, preferably from 0.2 to 6 wt.%, more preferably from 0.5 to 5 wt.%. Another preferred level is from 1 to 4 wt.%.

[0048] The alkoxylated polyamine may be linear or branched. It may be branched to the extent that it is a dendrimer. The alkoxylation may typically be ethoxylation or propoxylation, or a mixture of both. Where a nitrogen atom is alkoxylated, a preferred average degree of alkoxylation is from 10 to 30, preferably from 15 to 25.

[0049] A preferred material is alkoxylated polyethylenimine, most preferably ethoxylated polyethyleneimine, with an average degree of ethoxylation being from 10 to 30 preferably from 15 to 25, where a nitrogen atom is ethoxylated.

Additional Enzymes

[0050] Additional enzymes, other than the specified lipase may be present in the detergent composition. It is preferred that additional enzymes are present in the preferred laundry detergent composition.

[0051] If present, then the level of each enzyme in the laundry composition of the invention is from 0.0001 wt.% to 0.1 wt.%.

[0052] Levels of enzyme present in the composition preferably relate to the level of enzyme as pure protein.

[0053] Preferred further enzymes include those in the group consisting of: proteases, cellulases, alpha-amylases, peroxidases/oxidases, pectate lyases, and/or mannanases. Said preferred additional enzymes include a mixture of two or more of these enzymes.

[0054] Preferably the further enzyme is selected from: proteases, cellulases, and/or alpha-amylases.

[0055] 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; aspargine 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 subdivisions, i.e. the Subtilisin family, the Thermitase family, the Proteinase K family, the Lantibiotic peptidase family, the Kexin family and the Pyrolysin family.

[0056] 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 Cellumonas described in WO 05/052161 and WO 05/052146.

[0057] Most preferably the protease is a subtilisins (EC 3.4.21.62).

[0058] 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 subsilisin 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 BI, 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.

[0059] Suitable commercially available protease enzymes include those sold under the trade names names Alcalase®, Blaze®; DuralaseTm, DurazymTm, Relase®, Relase® Ultra, Savinase®, Savinase® Ultra, Primase®, Polarzyme®, Kannase®, Liquanase®, Liquanase® Ultra, Ovozyme®, Coronase®, Coronase® Ultra, Neutrase®, Everlase® and Esperase® all could be sold as Ultra® or Evity® (Novozymes A/S).

[0060] The composition may 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.

[0061] 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™, Amplify™, Fungamyl™ and BAN™ (Novozymes A/S), Rapidase™ and Purastar™ (from Genencor International Inc.).

[0062] 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.

[0063] 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).

[0064] Further enzymes suitable for use are discussed in WO 2009/087524, WO 2009/090576, WO 2009/107091, WO 2009/111258 and WO 2009/148983.

[0065] 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

[0066] 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.

Further materials

[0067] Further optional but preferred materials that may be included in the detergent compositions (preferably laundry detergent compositions) include fluorescent agent, perfume, shading dyes, polymers and chelating agents.

Fluorescent Agent

[0068] 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.

[0069] The total amount of the fluorescent agent or agents used in the composition is generally from 0.0001 to 0.5 wt.%, preferably 0.005 to 2 wt.%, more preferably 0.01 to 0.1 wt.%.

[0070] 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.

[0071] Preferred fluorescers are fluorescers with CAS-No 3426-43-5; CAS-No 35632-99-6; CAS-No 24565-13-7; CAS-No 12224-16-7; CAS-No 13863-31-5; CAS-No 4193-55-9; CAS-No 16090-02-1; CAS-No 133-66-4; CAS-No 68444-86-0; CAS-No 27344-41-8.

[0072] Most preferred fluorescers are: sodium 2 (4-styryl-3-sulfophenyl)-2H-napthol[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.

[0073] The aqueous solution used in the method has a fluorescer present. The fluorescer is present in the aqueous solution used in the method preferably in the range from 0.0001 g/l to 0.1 g/l, more preferably 0.001 to 0.02 g/l.

Perfume

[0074] The composition preferably comprises a perfume. 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.

[0075] 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; verdyl 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; cedry formate; cyclohexyl salicyate; gamma-dodecalactone; and, beta phenylethyl phenyl acetate.

[0076] 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 Flavour Ingredients, 1975, CRC Press; Synthetic Food Adjuncts, 1947 by M. B. Jacobs, edited by Van Nostrand; or Perfume and Flavour Chemicals by S. Arctander 1969, Montclair, N.J. (USA).

[0077] 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.

[0078] 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.

[0079] The International Fragrance Association has published a list of fragrance ingredients (perfumes) in 2011. (http://www.ifraorg.org/en-us/ingredients#.U7Z4hPldWzk)

[0080] The Research Institute for Fragrance Materials provides a database of perfumes (fragrances) with safety information.

[0081] Perfume top note may be used to cue the whiteness and brightness benefit of the invention.

[0082] 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 (ie. 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-jasmone, 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 (tricyclco 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 heptine carbonate, methyl heptyl ketone, methyl hexyl ketone, methyl phenyl carbinyl 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. 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 from the list given of delayed blooming perfumes given above present in the perfume.

[0083] 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.

[0084] It is preferred that the laundry treatment composition does not contain a peroxygen bleach, e.g., sodium per-carbonate, sodium perborate, and peracid.

Shading Dye

[0085] Preferably when the composition is a laundry detergent composition, then it comprises a shading dye. Preferably the shading dye is present at from 0.0001 to 0.1 wt.% of the composition.

[0086] 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).

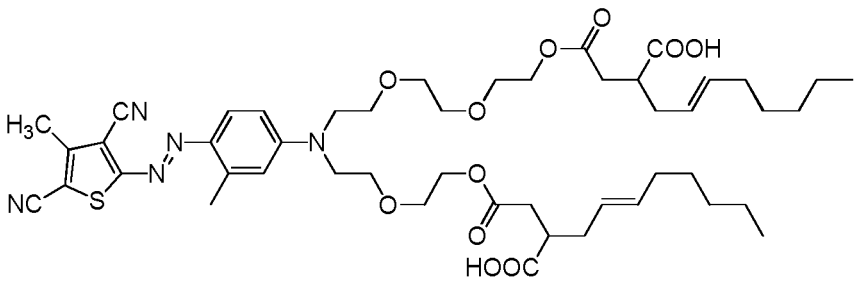
[0087] Shading Dyes for use in laundry compositions preferably have an extinction coefficient at the maximum absorption in the visible range (400 to 700nm) of greater than 5000 L mol^{-1} cm^{-1}, preferably greater than 10000 L mol^{-1} cm^{-1}. The dyes are blue or violet in colour.

[0088] Preferred shading dye chromophores are azo, azine, anthraquinone, and triphenylmethane.

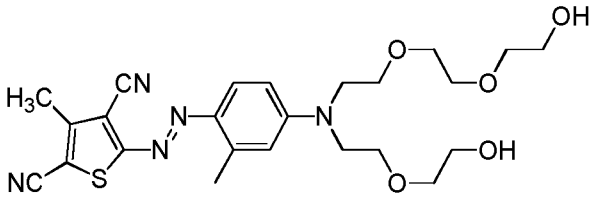
[0089] Azo, anthraquinone, phthalocyanine and triphenylmethane dyes preferably carry a net anionic charged or are uncharged. Azine preferably carry a net anionic or cationic charge. Blue or violet shading dyes deposit to fabric during the wash or rinse step of the washing process providing a visible 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.

[0090] 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).

[0091] Mono-azo dyes preferably contain a heterocyclic ring and are most preferably thiophene dyes. The mono-azo dyes are preferably alkoxylated and are preferably uncharged or anionically charged at pH=7. Alkoxylated thiophene dyes are discussed in WO/2013/142495 and WO/2008/087497. Preferred examples of thiophene dyes are shown below:

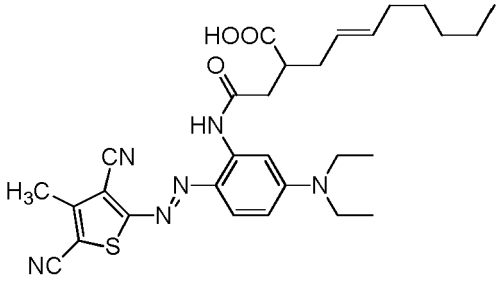


;



;

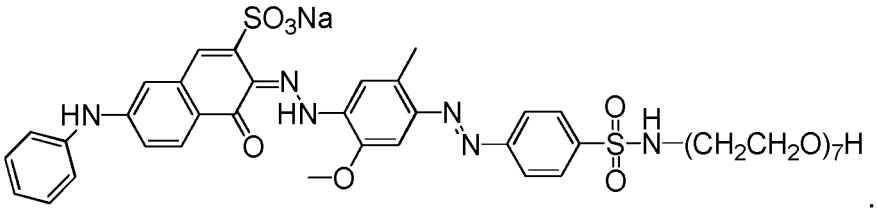
and,



.

[0092] 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 alkoxylated versions thereof. Alkoxylated bis-azo dyes are discussed in WO2012/054058 and WO2010/151906.

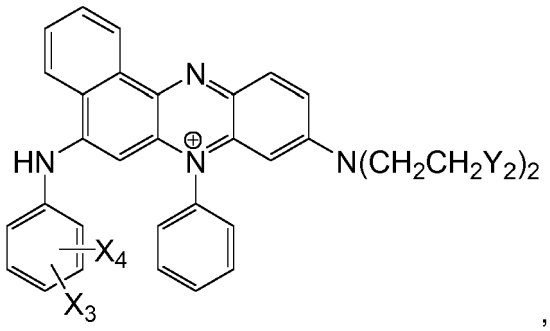
[0093] An example of an alkoxylated bis-azo dye is :



.

[0094] Thiophene dyes are available from Milliken under the tradenames of Liquitint Violet DD and Liquitint Violet ION.

[0095] Azine dye 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:



,

wherein:

X_3 is selected from: -H; -F; $-CH_3$; $-C_2H_5$; $-OCH_3$; and, $-OC_2H_5$;
X_4 is selected from: -H; $-CH_3$; $-C_2H_5$; $-OCH_3$; and, $-OC_2H_5$;
Y_2 is selected from: -OH; $-OCH_2CH_2OH$; $-CH(OH)CH_2OH$; $-OC(O)CH_3$; and, $C(O)OCH_3$.

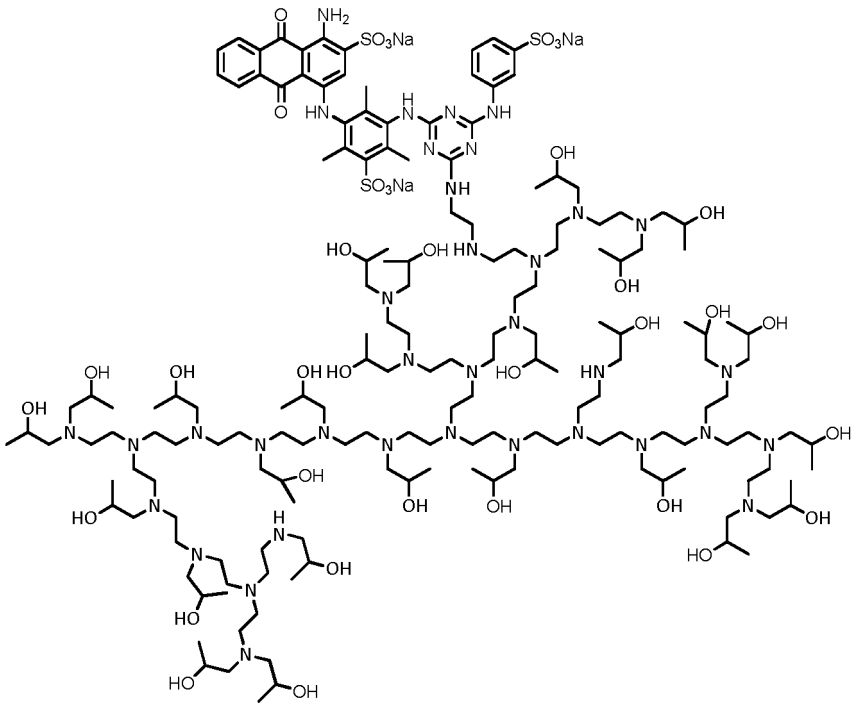
[0096] The shading dye is present is present in the composition in range from 0.0001 to 0.5 wt %, preferably 0.001 to 0.1 wt%. Depending upon the nature of the shading dye there are preferred ranges depending upon the efficacy of the

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.

[0097] A mixture of shading dyes may be used.

[0098] The shading dye is most preferably a reactive blue anthraquinone dye covalently linked to an alkoxylated 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.

[0099] An example structure of a preferred reactive anthraquinone covalently attached to a propoxylated polyethylene imine is:



(Structure I).

Polymers

[0100] The composition may comprise one or more further polymers. Examples are carboxymethylcellulose, poly (ethylene glycol), poly(vinyl alcohol), polycarboxylates such as polyacrylates, maleic/acrylic acid copolymers and lauryl methacrylate/acrylic acid copolymers.

Chelating Agent

[0101] Chelating agents may be present or absent from the detergent compositions.

[0102] If present, then the chelating agent is present at a level of from 0.01 to 5 wt.%.

[0103] Example phosphonic acid (or salt thereof) chelating agents are: 1-Hydroxyethylidene-1,1-diphosphonic acid (HEDP); Diethylenetriaminepenta(methylenephosphonic acid) (DTPMP); Hexamethylenediaminetetra(methylenephosphonic acid) (HDTMP); Aminotris(methylenephosphonic acid) (ATMP); Ethylenediaminetetra(methylenephosphonic acid) (EDTMP); Tetramethylenediaminetetra(methylenephosphonic acid) (TDTMP); and, Phosphonobutanetricarboxylic acid (PBTC).

Examples

[0104] The invention will be demonstrated by the following non-limiting examples.

Examples

Lipase - type hydrolase *(Vulcanisaeta moutnovskia)*

Cloning & expression including sequence information

[0105] The DNA sequence encoding a protein with putative hydrolytic activity was identified in the genome of *Vulcanisaeta moutnovskia* genome synthesized by GeneArt with codon optimization for *Escherichia coli.* Cloning was performed using the aLICator LIC Cloning and Expression Kit for an N-terminal Hiss-tag (pLATE51). *E. coli* XL2 blue was used as cloning strain and transformed using the heat-shock method. After plasmid isolation the plasmid was sequenced and the cloning success confirmed. *E. coli* BL21 (DE3) was transformed (heat-shock) and used as an expression strain for protein production.

alpha/beta hydrolase *[Vulcanisaeta moutnovskia]*

[0106]

MPLDPAVGRVLEELNKVMPQMTKIPLSEFRKMFRAFFASQSRRSIYKVYDITIPGTEAKIPVR
IYVPREGTDLGILVYFHGGGFVLGDVETYDPLCRELAVACDCVVVSVDYRLAPEHKFPAAVI
DSFDSTKWVLEHAREINGDPEKVAVGGDSAGGNLAAVVAIMARDQGLKPSLKYQVLINPFV
GVDPASYTIREYSTGLFLEREAMAFFNKAYLRSPADAFDPRFSPILIDNLSNLPPALIITSEYD
PLRDSAETYAAKLAESGVPTIVVRFNGVTHGFYGFPIPHAKAAVGLIGTTLRQAFYGKY

Fermentation (harvest) & purification

[0107] Protein production was performed in 2L Erlenmeyer flasks with 1L LB-medium and the appropriate antibiotic for plasmid selection (Ampicillin, 100 μg/mL). The LB-medium was inoculated with 1-3% (v/v) of preculture and incubated at 37°C and 180rpm until reaching OD_{600} = 0.6. The gene expression was induced by addition of IPTG to final 1mM and carried out for 3h at 37°C and 180rpm. Cells were harvested by centrifugation (4750 x g, 20 min, 4 °C) and stored at -80°C. Cell lysis was performed by resuspension of the cell paste in equilibration buffer (25 mM Tris-HCl, pH 8.0., 250 mM NaCl, 20 mM Imidazole, 0.1 % Triton X-100, 5% Glycerol, 10mL buffer for 1g cell wet weight) and sonication on ice to break the cells. The protein purification was performed using a 1mL HisTrap FF column using an AKTA purifier system for affinity chromatography via the poly Histidine-tag. Elution of the protein was performed via a linear gradient for 30 min using buffer with increased imidazole concentration (25 mM Tris-HCl, pH 8.0., 250 mM NaCl, 500 mM Imidazole, 0.1 % Triton X-100, 5% Glycerol). Elution fractions were identified via absorbance (280nm) and applied to an SDS-PAGE. Fractions containing the protein of interest were pooled and dialysed overnight against 5 L of buffer without imidazole (25 mM Tris-HCl, pH 8.0, 250 mM NaCl). The dialysed protein was supplemented with 0.005% (v/v) sodium azide and 10% (v/v) glycerol for freezing and storage at -80°C.

Bioanalytics

Determination of protein concentration

[0108] The total amount of protein of enzyme samples was estimated by using Sigma-Aldrich (bicinchoninic acid) BCA assay kit. The BCA reagent was prepared by mixing solution A [1% (*w*/*v*) bicinchoninic acid in sodium salt form, 2% *(w/v)* sodium carbonate, 0.16% (*w*/*v*) sodium tartrate, 0.4% *(w/v)* sodium hydroxide, 0.95% *(w/v)* sodium hydrogen carbonate, pH 11.5] with solution B [4% *(w/v)* copper sulphate] at 50:1 (v/v) ratio. A serial dilution of bovine serum albumin (2mg/mL) was carried out in deionised water to create 7 points of a standard curve. To perform the assay, BCA reagent (200μL) was added into the wells of 96-well plate, followed by sample protein dilutions (20μL). The microtitre plates (MTP) were sealed and incubated at 37°C for 30min. After incubation, the absorbance at 540nm was measured on a spectrophotometer.

Determination of lipase purity

[0109] Lipase-containing protein samples (20μL) were prepared with SDS-PAGE loading buffer and heated at 70°C

for 10min before running on 4-12% NuPage Bis-Tris gels with MOPS buffer at 170V. PageRulerPlus molecular weight marker were run alongside samples for the determination of the molecular mass. Each gel was then stained using GelCode Blue Safe protein stain Scientific) following the manufacturers protocol.

Biochemical determination of lipase activity

[0110] Lipase activity was determined by a colorimetric method using 4-nitrophenyl-valerate (C5) and 4-nitrophenyl-dodecanoate (C12) as substrates. 4-nitrophenyl-dodecanoate (25mg) or 4-nitrophenyl-valerate (18mg) were dissolved in 10mL solvent (methanol) to prepare 8mM stock solutions. Before carrying out the assay, 1mL of stock solution was added in 7mL of acidified water (pH 4.5), to give a final concentration of 1mM. In 96-well microtitre plates, 60μL dH_2O, 115μL Tris-HCl buffer (pH 8.5, 50mM), 5μL of diluted enzyme solution and 20μL substrate (multi-channel at the end) were added. For blanks, enzyme solution was replaced with dH_2O. Following the addition of reagents, the release of product (4-nitrophenol) was monitored at 405nm for 15min at ambient temperature.

APPLICATION TESTING

Composition of model human-like sebum and application to fabric

[0111] Table 1A shows the composition of human-like sebum to be used in the wash studies, and which is comparable to human sebum analysed in the literature (table 1B). Macrolex violet dye (0.4% *w*/*w*) was added to the model sebum, and then 100μL applied to a 10x10cm swatch of polycotton which was pre-heated to 60°C. Wicking of the stain was facilitated by leaving the stain to dry o/n at 60°C. Uniformity of staining was confirmed by colourimetric determination of SRI values across the swatch which was subsequently cut into smaller 30 mm diameter circles, enabling a fit in 6-well microtitre plates for subsequent wash trials.

Table 1: (A) Composition of the human-like sebum tested. Shown in comparison (B) is the composition of human sebum as proposed by Nikkari 1974, In Ro 2005, Stefaniak 2010. Model human-like sebum was designed to mimic the literature description.

(A) Model human-like sebum tested		
Ingredient	**Type**	**% inclusion**
Oleic Acid	Fatty acids (12%)	8
Isostearic Acid		4
Tricaprin	Triglycerides (39.2%)	1.8
Triolein		28.2
Triisostearin		9.2
Oleyl oleate	Wax esters (29.8%)	11.9
Myristyl myristate		11.9
Isostearyl isostearate		6
Squalene	Squalene (13.8%)	13.8
Cholesterol oleate	Cholesterol (esters) (5.1%)	3.4
Cholesterol		1.7
Total		**99.9**
(B) Human sebum (literature)		
Type	**% inclusion median** (range)	
Fatty acids	28.3 (2.3 - 38.3)	
Triglycerides	32.5 (14.8 - 44)	
Wax esters	25 (10 - 26)	
Squalene	10.6 (3.3 - 20)	

(continued)

(B) Human sebum (literature)	
Type	**% inclusion median** (range)
Cholesterol (esters)	6 (1 - 9.5)

Wash studies for enzymatic cleaning performance against human-like sebum

[0112] Pre-wash readings were taken for the 30 mm diameter sebum stains to measure stain intensity. Wash studies were conducted either in a 5 mL volume (within a 6 well plate, at 40 °C for 1 hour at 100 rpm) or in 100mL (within glass bottles, at 40 °C for 1 hour at 100 rpm). Enzymes were present at 25 mg/L within 2 g/L of a 7.5% surfactancy formulation. The stains were then rinsed three times post wash to completely remove the wash liquor and any residual enzyme. After drying, the stain plates were digitally scanned and their deltaE measured. This value is used to express cleaning effect and is defined as the colour difference between a white cloth and that of the stained cloth after being washed.

[0113] Mathematically, the definition of deltaE is:

$$\text{deltaE} = [\ (\Delta L)\ 2 + (\Delta a)\ 2 + (\Delta b)\ 2\ ]\ 1/2$$

wherein ΔL is a measure of the difference in darkness between the washed and white cloth; Δa and Δb are measures for the difference in redness and yellowness respectively between both cloths. From this equation, it is clear that the lower the value of deltaE, the whiter the cloth will be. With regard to this colour measurement technique, reference is made to Commission International de l'Eclairage (CIE); Recommendation on Uniform Colour Spaces, colour difference equations, psychometric colour terms, supplement no. 2 to CIE Publication, no. 15, Colormetry, Bureau Central de la CIE, Paris 1978.

[0114] Herein the cleaning effect is expressed in the form of a stain removal index (SRI):

$$\text{SRI} = 100 - \text{deltaE}.$$

[0115] The higher the SRI the cleaner the cloth, SRI = 100 (white).

Enzymatic cleaning performance against human-like sebum

[0116] Wash studies in a 5mL wash volume identified that the lipase enzyme of SEQ ID 1 showed improved performance towards removal of the human-like sebum than the control samples which includes the current commercial laundry lipase benchmark (Lipex Evity). Test was carried out in triplicate at 40°C for 1h. Formulation applied contains 7.5% total surfactant.

[0117] The >5 units SRI increase for the lipase enzyme of the invention is a clearly visualised cleaning improvement compared to Lipex Evity (table 2).

Table 2: Cleaning performance of lipase enzyme of SEQ ID 1 (towards model human-like sebum) shown in comparison to controls of washes in either: water, or formulation plus benchmark commercial laundry lipase (Lipex Evity)

Sample	Wash performance (SRI)
Negative Control (water)	68.5 ± 1.03
Positive Control (formulation + Lipex Evity)	70.6 ± 0.6
Invention (formulation + lipase of SEQ ID 1)	78.4 ± 1.19

[0118] The stain removal index (SRI) indicating wash performance was measured. The ± statistics relates to 95% confidence level. The test shows that the lipase of SEQ ID 1 had much better performance against sebum than the commercial enzyme (Lipex Evity).

[0119] Lipex Evity has approx. 21% sequence identity with SEQ ID NO:1.

Enzymatic cleaning performance against human-like sebum

[0120] Wash studies in a 100mL volume confirm that the lipase of SEQ ID 1 shows improved performance towards removal of the human-like sebum than the control samples which includes the current laundry lipase benchmark (Lipex Evity) (Table 3). Test was carried out in triplicate at 40°C for 1h. Formulation applied contains 7.5% total surfactant.

Table 3: Cleaning performance of lipase enzyme of SEQ ID 1 (towards model human-like sebum) shown in comparison to controls of washes in either: water, or formulation plus benchmark commercial laundry lipase (Lipex Evity)

Sample	Wash performance (SRI)
Negative Control (water)	72.6 ± 1.2
Positive Control (formulation + Lipex Evity)	79.7 ± 1.28
Invention (formulation + lipase of SEQ ID 1)	83.1 ± 0.8

Claims

1. A detergent composition comprising:

(i) from 1 to 60 wt.%, preferably from 2 to 50 wt.%, more preferably from 3 to 45 wt.%, even more preferably from 5 to 40 wt.%, most preferably from 6 to 40 wt.% of a surfactant; and,
(ii) from 0.0005 to 5 wt.%, preferably from 0.005 to 2.5 wt.%, more preferably from 0.01 to 1 wt.% of a lipase enzyme having at least 60% sequence identity to SEQ ID NO: 1.

2. A detergent composition according to claim 1, wherein the lipase enzyme has at least 70%, more preferably at least 75%, more preferably at least 80%, more preferably at least 85%, even more preferably at least 90%, even more preferably at least 95%, most preferably at least 97%, at least 98% or even at least 99% sequence identity to SEQ ID NO: 1.

3. A detergent composition according to claim 1 or claim 2, wherein the lipase enzyme has 100% sequence identity to SEQ ID NO: 1.

4. A detergent composition according to any preceding claim, comprising from 0.1 to 10 wt.%, preferably from 0.2 to 9 wt.%, more preferably from 0.25 to 8, even more preferably from 0.5 to 6 wt.%, most preferably from 1 to 5 wt.% of a soil release polymer, more preferably a polyester based soil released polymer.

5. A detergent composition according to claim 4, wherein the polyester soil release polymer is a polyethylene and/or polypropylene terephthalate based soil release polymer, preferably a polypropylene terephthalate based soil release polymer.

6. A detergent composition according to any preceding claim, wherein the detergent composition comprises an alkoxylated polyamine, preferably at a level of from 0.1 to 8 wt.%, more preferably from 0.2 to 6 wt.%, most preferably from 0.5 to 5 wt.%.

7. A detergent composition according to any preceding claim, wherein the detergent composition is a laundry detergent composition, preferably the laundry detergent composition is a liquid or a powder, most preferably a liquid detergent.

8. A laundry detergent composition according to claim 7, wherein the surfactant comprises anionic and/or nonionic surfactant, preferably comprising both anionic and nonionic surfactant.

9. A detergent composition according to any preceding claim, preferably a laundry detergent composition, additionally comprising a further enzyme selected from the group consisting of: proteases, cellulases, alpha-amylases, peroxidases/oxidases, pectate lyases, and/or mannanases.

10. A detergent composition according to any preceding claim, preferably a laundry detergent composition, additionally comprising a further ingredient selected from fluorescent agent, perfume, shading dyes and polymers, and mixtures thereof.

11. A method of treatment of a fabric substrate with a sebum stain, said method comprising incorporation of a lipase enzyme having at least 60%, preferably at least 70%, more preferably at least 75%, more preferably at least 80%, more preferably at least 85%, even more preferably at least 90%, even more preferably at least 95%, most preferably at least 97%, at least 98% or even at least 99% sequence identity to SEQ ID NO: 1 into a detergent composition comprising from 1 to 60 wt.% of a surfactant; and subsequent treatment of a fabric substrate with a sebum stain, with said composition.

12. Use of an enzyme having at least 60%, preferably at least 70%, more preferably at least 75%, more preferably at least 80%, more preferably at least 85%, even more preferably at least 90%, even more preferably at least 95%, most preferably at least 97%, at least 98% or even at least 99% sequence identity to SEQ ID NO: 1 to improve cleaning of sebum stains on fabric.

Patentansprüche

1. Reinigungsmittelzusammensetzung, umfassend:

   (i) 1 bis 60 Gew.-%, bevorzugt 2 bis 50 Gew.-%, bevorzugter 3 bis 45 Gew.-%, noch bevorzugter 5 bis 40 Gew.-%, höchst bevorzugt 6 bis 40 Gew.-% eines Tensids; und
   (ii) 0,0005 bis 5 Gew.-%, bevorzugt 0,005 bis 2,5 Gew.-%, bevorzugter 0,01 bis 1 Gew.-% eines Lipaseenzyms mit mindestens 60% Sequenzidentität mit SEQ ID NO:1.

2. Reinigungsmittelzusammensetzung nach Anspruch 1, wobei das Lipaseenzym mindestens 70%, bevorzugter mindestens 75%, bevorzugter mindestens 80%, bevorzugter mindestens 85%, noch bevorzugter mindestens 90%, noch bevorzugter mindestens 95%, höchst bevorzugt mindestens 97%, mindestens 98% oder sogar mindestens 99% Sequenzidentität mit SEQ ID NO:1 aufweist.

3. Reinigungsmittelzusammensetzung nach Anspruch 1 oder Anspruch 2, wobei das Lipaseenzym 100% Sequenzidentität mit SEQ ID NO:1 aufweist.

4. Reinigungsmittelzusammensetzung nach einem vorhergehenden Anspruch, umfassend 0,1 bis 10 Gew.-%, bevorzugt 0,2 bis 9 Gew.-%, bevorzugter 0,25 bis 8 Gew.-%, noch bevorzugter 0,5 bis 6 Gew.-%, höchst bevorzugt 1 bis 5 Gew.-% eines Soil-Release-Polymers, bevorzugter eines Soil-Release-Polymers auf Polyesterbasis.

5. Reinigungsmittelzusammensetzung nach Anspruch 4, wobei das Polyester-Soil-Release-Polymer ein Soil-Release-Polymer auf Polyethylen- und/oder Polypropylenterephthalatbasis ist, vorzugsweise ein Soil-Release-Polymer auf Polypropylenterephthalatbasis.

6. Reinigungsmittelzusammensetzung nach einem vorhergehenden Anspruch, wobei die Reinigungsmittelzusammensetzung ein alkoxyliertes Polyamin, bevorzugt mit einem Anteil von 0,1 bis 8 Gew.-%, bevorzugter von 0,2 bis 6 Gew.-%, höchst bevorzugt von 0,5 bis 5 Gew.-%, umfasst.

7. Reinigungsmittelzusammensetzung nach einem vorhergehenden Anspruch, wobei die Reinigungsmittelzusammensetzung eine Wäschereinigungsmittelzusammensetzung ist, wobei die Wäschereinigungsmittelzusammensetzung bevorzugt eine Flüssigkeit oder ein Pulver, höchst bevorzugt ein flüssiges Waschmittel ist.

8. Wäschereinigungsmittelzusammensetzung nach Anspruch 7, wobei das Tensid anionisches und/oder nichtionisches Tensid umfasst, bevorzugt sowohl anionisches als auch nichtionisches Tensid.

9. Reinigungsmittelzusammensetzung nach einem vorhergehenden Anspruch, bevorzugt eine Wäschereinigungsmittelzusammensetzung, die zusätzlich ein weiteres Enzym umfasst, ausgewählt aus der Gruppe, bestehend aus: Proteasen, Cellulasen, Alpha-Amylasen, Peroxidasen/Oxidasen, Pektatlyasen und/oder Mannanasen.

10. Reinigungsmittelzusammensetzung nach einem vorhergehenden Anspruch, bevorzugt eine Wäschereinigungsmittelzusammensetzung, die zusätzlich einen weiteren Bestandteil umfasst, ausgewählt unter Fluoreszenzmittel, Parfüm, Nuancierungsfarbstoffen und Polymeren und Mischungen davon.

11. Verfahren zur Behandlung eines Textilsubstrats mit Talgflecken, wobei das Verfahren die Einarbeitung eines Lipa-

seenzyms mit mindestens 60%, bevorzugt mit mindestens 70%, bevorzugter mit mindestens 75%, bevorzugter mit mindestens 80%, bevorzugter mit mindestens 85%, noch bevorzugter mit mindestens 90%, noch bevorzugter mit mindestens 95%, höchst bevorzugt mit mindestens 97%, mit mindestens 98% oder sogar mit mindestens 99% Sequenzidentität mit SEQ ID NO:1, in eine Reinigungsmittelzusammensetzung, umfassend 1 bis 60 Gew.-% eines Tensids, und nachfolgende Behandlung eines Textilsubstrats mit Talgflecken mit dieser Zusammensetzung umfaßt.

12. Verwendung eines Enzyms mit mindestens 60%, bevorzugt mit mindestens 70%, bevorzugter mit mindestens 75%, bevorzugter mit mindestens 80%, bevorzugter mit mindestens 85%, noch bevorzugter mit mindestens 90%, noch bevorzugter mit mindestens 95%, höchst bevorzugt mit mindestens 97%, mit mindestens 98% oder sogar mit mindestens 99% Sequenzidentität mit SEQ ID NO:1, um die Reinigung von Textilien mit Talgflecken zu verbessern.

Revendications

1. Composition détergente comprenant :

(i) 1 à 60 % en poids, de préférence 2 à 50 % en poids, mieux encore 3 à 45 % en poids, plus particulièrement 5 à 40 % en poids, tout spécialement 6 à 40 % en poids d'un tensioactif ; et
(ii) 0,0005 à 5 % en poids, de préférence 0,005 à 2,5 % en poids, mieux encore 0,01 à 1 % en poids d'une enzyme lipase ayant une identité de séquence d'au moins 60 % avec la SEQ ID NO : 1.

2. Composition détergente selon la revendication 1, dans laquelle l'enzyme lipase a une identité de séquence d'au moins 70 %, mieux encore d'au moins 75 %, mieux encore d'au moins 80 %, mieux encore d'au moins 85 %, plus particulièrement d'au moins 90 %, plus particulièrement d'au moins 95 %, tout spécialement d'au moins 97 %, d'au moins 98 % ou même d'au moins 99 % avec la SEQ ID NO : 1.

3. Composition détergente selon la revendication 1 ou la revendication 2, dans laquelle l'enzyme lipase a une identité de séquence de 100 % avec la SEQ ID NO : 1.

4. Composition détergente selon l'une quelconque des revendications précédentes, comprenant 0,1 à 10 % en poids, de préférence 0,2 à 9 % en poids, mieux encore 0,25 à 8 % en poids, plus particulièrement 0,5 à 6 % en poids, tout spécialement 1 à 5 % en poids d'un polymère d'enlèvement des salissures, mieux encore d'un polymère d'enlèvement des salissures à base de polyester.

5. Composition détergente selon la revendication 4, dans laquelle le polymère d'enlèvement des salissures de type polyester est un polymère d'enlèvement des salissures à base de poly(téréphtalate d'éthylène et/ou de propylène), de préférence un polymère d'enlèvement des salissures à base de poly(téréphtalate de propylène).

6. Composition détergente selon l'une quelconque des revendications précédentes, laquelle composition détergente comprend une polyamine alcoxylée, de préférence à raison de 0,1 à 8 % en poids, mieux encore de 0,2 à 6 % en poids, tout spécialement de 0,5 à 5 % en poids.

7. Composition détergente selon l'une quelconque des revendications précédentes, laquelle composition détergente est une composition détergente pour le linge, de préférence la composition détergente pour le linge est un liquide ou une poudre, tout spécialement un détergent liquide.

8. Composition détergente pour le linge selon la revendication 7, dans laquelle le tensioactif comprend un tensioactif anionique et/ou non-ionique, de préférence comprend à la fois un tensioactif anionique et un tensioactif non-ionique.

9. Composition détergente selon l'une quelconque des revendications précédentes, de préférence une composition détergente pour le linge, comprenant de plus une autre enzyme choisie dans le groupe constitué par : les protéases, les cellulases, les alpha-amylases, les peroxydases/oxydases, les pectate lyases, et/ou les mannanases.

10. Composition détergente selon l'une quelconque des revendications précédentes, de préférence une composition détergente pour le linge, comprenant de plus un autre ingrédient choisi parmi un agent fluorescent, un parfum, les colorants de nuançage et les polymères, ainsi que leurs mélanges.

11. Méthode de traitement d'un substrat en étoffe avec une tache de sébum, ladite méthode comprenant l'incorporation

d'une enzyme lipase ayant une identité de séquence d'au moins 60 %, de préférence d'au moins 70 %, mieux encore d'au moins 75 %, mieux encore d'au moins 80 %, mieux encore d'au moins 85 %, plus particulièrement d'au moins 90 %, plus particulièrement d'au moins 95 %, tout spécialement d'au moins 97 %, d'au moins 98 % ou même d'au moins 99 %, avec la SEQ ID NO : 1, dans une composition détergente liquide comprenant 1 à 60 % en poids d'un tensioactif ; et le traitement subséquent avec ladite composition d'un substrat en étoffe avec une tache de sébum.

12. Utilisation d'une enzyme ayant une identité de séquence d'au moins 60 %, de préférence d'au moins 70 %, mieux encore d'au moins 75 %, mieux encore d'au moins 80 %, mieux encore d'au moins 85 %, plus particulièrement d'au moins 90 %, plus particulièrement d'au moins 95 %, tout spécialement d'au moins 97 %, d'au moins 98 % ou même d'au moins 99 %, avec la SEQ ID NO : 1, pour améliorer le nettoyage de taches de sébum sur une étoffe.

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