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Description

This invention relates to detergent compositions for washing fabrics, in particular to detergent compositions which are capable of cleaning and softening fabrics from the same wash liquor.

5 Detergent compositions for simultaneously cleaning and softening fabrics are known in the art. Conventionally such compositions contain, as a detergent active material, an anionic surfactant to clean the fabrics and a cationic fabric softening agent. However, there is a tendency for the anionic and cationic components of such compositions to react with each other, either in the product itself or in the wash liquor, with the result that the efficiency of the cationic softening agent is significantly reduced.

10 Various solutions to this problem have been proposed. One such proposal, as described in United States patent specification 3 936 537 (BASKERVILLE et al assigned to THE PROCTER & GAMBLE COMPANY) is to combine the cationic components in a separate particle with a dispersion inhibitor, such as a long chain alkanol, with the object of reducing the interaction with the anionic surfactant in the wash liquor.

An alternative proposal is to avoid the use of anionic surfactants, by for example using nonionic surfactants as described in British Patent Specification GB 1 079 388 (GENERAL FOODS CORPORATION).

15 A further series of proposals relate to the use of alternative fabric softening agents in place of the cationic material. One such example is to use cellulolytic enzymes, ie cellulase, as a harshness-reducing agent, as disclosed in British Patent Specification GB 1 368 599 (UNILEVER). Other enzymes, such as proteolytic enzymes like Alcalase, do not provide softening benefits. A further example is to use various clay materials as disclosed in United States patent specification US 4 062 647 (STORM et al assigned to THE PROCTER & GAMBLE COMPANY).

To date, none of these various proposals by themselves, have lead to commercially successful products.

25 It is thought that cellulase achieves its anti-harshening effect on eg cotton, by cleaving and thereby assisting the removal of the cellulosic fibrils which form on the fabric fibres in the normal washing process, the bonding of these fibrils to each other and the cotton fibres themselves being responsible for introducing a degree of rigidity, that is harshening, to the fabric surface. On the other hand it is believed that clay materials achieve their softening benefit by coating the fibres and fibrils with a layer of lubricating material thereby lowering the friction between fibrils and fibrils/fibres reducing the tendency of the fibrils to bond together. One would expect therefore that where a composition contains cellulase as a fabric softening agent, there is nothing to be gained from the additional inclusion of clay materials, the fibrils having been removed following cellulase action. Looking at the matter in another manner, one would expect that where a composition contains a clay material as a softening agent, there is nothing to be gained from the additional inclusion of cellulase, the clay coating in the fibrils effectively screening the fibrils from attack by the cellulase, which is known to be selective towards cellulosic materials and not in any way to attack clay materials.

35 For this reason one would expect that in compositions which contain both cellulase and clay materials, these softening agents would appear to mutually inhibit one another and we believe it is for this reason that compositions containing both cellulase and clay materials as softening agents have not previously been proposed.

40 We have now surprisingly discovered however that this mutual inhibition does not occur in practice and that therefore fabric washing compositions which contain both cellulase and clay materials as softening agents provide surprisingly good softening results.

Thus, according to the invention, there is provided a detergent composition for cleaning and softening fabrics comprising:

- (i) a detergent active material;
- (ii) a fabric softening clay material; and
- (iii) cellulase.

50 We are aware of British patent specification Nos. 2 094 826, 2 095 275 and 2 124 244 (KAO SOAP) which disclose detergent compositions which contain specific types of cellulase to provide improved detergency. In these specifications clay, of unspecified type, is mentioned as an ingredient for inhibiting caking of the compositions.

The compositions according to the invention necessarily contain a detergent active material, otherwise referred to herein simply as a detergent compound. The detergent compounds may be selected from anionic, nonionic, zwitterionic and amphoteric synthetic detergent active materials. Many suitable detergent compounds are commercially available and are fully described in the literature, for example in "Surface Active Agents and Detergents", Volumes I and II, by Schwartz, Perry and Berch.

The preferred detergent compounds which can be used are synthetic anionic and nonionic compounds.

The former are usually water-soluble alkali metal salts of organic sulphates and sulphonates having alkyl radicals containing from about 8 to about 22 carbon atoms, the term alkyl being used to include the alkyl portion of higher acyl radicals. Examples of suitable synthetic anionic detergent compounds are sodium and potassium alkyl sulphates, especially those obtained by sulphating higher (C_8 - C_{18}) alcohols produced for example from tallow or coconut oil, sodium and potassium alkyl (C_9 - C_{20}) benzene sulphonates, particularly sodium linear secondary alkyl (C_{10} - C_{15}) benzene sulphonates; sodium alkyl glyceryl ether sulphates, especially those ethers of the higher alcohols derived from tallow or coconut oil and synthetic alcohols derived from petroleum; sodium coconut oil fatty monoglyceride sulphates and sulphonates; sodium and potassium salts of sulphuric acid esters of higher (C_8 - C_{18}) fatty alcohol-alkylene oxide, particularly ethylene oxide, reaction products; the reaction products of fatty acids such as coconut fatty acids esterified with isethionic acid and neutralised with sodium hydroxide; sodium and potassium salts of fatty acid amides of methyl taurine; alkane monosulphonates such as those derived by reacting alpha-olefins (C_8 - C_{20}) with sodium bisulphite and those derived from reacting paraffins with SO_2 and Cl_2 and then hydrolysing with a base to produce a random sulphonate; and olefin sulphonates, which term is used to describe the material made by reacting olefins, particularly C_{10} - C_{20} alpha-olefins, with SO_3 and then neutralising and hydrolysing the reaction product. The preferred anionic detergent compounds are sodium (C_{11} - C_{15}) alkyl benzene sulphonates and sodium (C_{16} - C_{18}) alkyl sulphates.

Suitable nonionic detergent compounds which may be used include in particular the reaction products of compounds having a hydrophobic group and a reactive hydrogen atom, for example aliphatic alcohols, acids, amides or alkyl phenols with alkylene oxides, especially ethylene oxide either alone or with propylene oxide. Specific nonionic detergent compounds are alkyl (C_6 - C_{22}) phenols-ethylene oxide condensates, generally 5 to 25 EO, ie 5 to 25 units of ethylene oxide per molecule, the condensation products of aliphatic (C_8 - C_{18}) primary or secondary linear or branched alcohols with ethylene oxide, generally 5 to 40 EO, and products made by condensation of ethylene oxide with the reaction products of propylene oxide and ethylenediamine. Other so-called nonionic detergent compounds include long chain tertiary amine oxides, long chain tertiary phosphine oxides and dialkyl sulfoxides.

Mixtures of detergent compounds, for example mixed anionic or mixed anionic and nonionic compounds may be used in the detergent compositions, particularly in the latter case to provide controlled low sudsing properties. This is beneficial for compositions intended for use in suds-intolerant automatic washing machines.

Amounts of amphoteric or zwitterionic detergent compounds can also be used in the compositions of the invention but this is not normally desired due to their relatively high cost. If any amphoteric or zwitterionic detergent compounds are used it is generally in small amounts in compositions based on the much more commonly used synthetic anionic and/or nonionic detergent compounds.

The effective amount of the detergent active compound or compounds used in the composition of the present invention is generally in the range of from 2 to 50%, preferably from 5 to 40% by weight, most preferably not more than 30% by weight of the composition.

A second essential component of the compositions of the present invention is a fabric softening clay material. This clay material should be a phyllosilicate clay with a 2:1 layer structure, which definition includes pyrophyllite clays, smectite or montmorillonite clays, saponites, vermiculites and micas. Clay materials which have been found to be unsuitable for fabric softening purposes include chlorites and kaolinites. Other aluminosilicate materials which do not have a layer structure, such as zeolites are also unsuitable as fabric softening clay materials. Particularly suitable clay materials are the smectite clays described in detail in US-A-3 959 155 (MONTGOMERY et al assigned to THE PROCTER & GAMBLE COMPANY), especially smectite clays such as described in US-A-3 936 537 (BASKERVILLE - referred to above) Other disclosures of suitable clay materials for fabric softening purposes include European patent specification EP 26528-A (PROCTER & GAMBLE LIMITED).

The most preferred clay fabric softening materials include those materials of bentonitic origin, bentonites being primarily montmorillonite type clays together with various impurities, the level and nature of which depends on the source of the clay material.

The level of fabric softening clay material in the compositions of the invention should be sufficient to provide the fabrics with a softening benefit. A preferred level is 1.5% to 35% by weight of the composition, most preferably from 4% to 15%, these percentages referring to the level of the clay mineral per se. Levels of clay raw material higher than this may be necessary when the raw material is derived from a particularly impure source.

A third essential component of the compositions of the invention is the cellulase.

The cellulase in the present invention may be any bacterial or fungal cellulase having a pH optimum of between 5 and 11.5. It is however preferred to use cellulases which have optimum activity at alkaline pH

values, such as those described in British Patent Specifications GB 2 075 028 A (NOVO INDUSTRIE A/S), GB 2 095 275 A (KAO SOAP CO LTD) and GB 2 094 826 A (KAO SOAP CO LTD).

Examples of such alkaline cellulases are cellulases produced by a strain of *Humicola insolens* (*Humicola grisea* var. *thermoidea*), particularly the *Humicola* strain DSM 1800, and cellulases produced by a
 5 fungus of *Bacillus N* or a cellulase 212-producing fungus belonging to the genus *Aeromonas*, and cellulase extracted from the hepatopancreas of a marine mollusc (*Dolabella Auricula* Solander).

The cellulase added to the composition of the invention may be in the form of a non-dusting granulate, eg "marumes" or "prills", or in the form of a liquid in which the cellulase is provided as a cellulase concentrate suspended in eg a nonionic surfactant or dissolved in an aqueous medium, having cellulase
 10 activity of at least 250 regular C_x cellulase activity units/gram, measured under the standard conditions as described in GB 2 075 028 A.

The amount of cellulase in the composition of the invention will, in general, be from about 0.1 to 10% by weight in whatever form. In terms of cellulase activity the use of cellulase in an amount corresponding to from 0.25 to 150 or higher regular C_x units/gram of the detergent composition is within the preferred scope
 15 of the present invention. A most preferred range of cellulase activity, however, is from 0.5 to 25 regular C_x units/gram of the detergent composition.

The compositions of the invention will generally include a detergency builder to improve the efficiency of the detergent active, in particular to remove calcium hardness ions from the water and to provide alkalinity. The builder material may be selected from precipitating builder materials (such as alkali metal
 20 carbonates, bicarbonates, borates, orthophosphates and silicates), sequestering builder materials (such as alkali metal pyrophosphates, polyphosphates, amino polyacetates, phytates, polyphosphonates, aminopolymethylene phosphonates and polycarboxylates), ion-exchange builder materials (such as zeolites and amorphous aluminosilicates), or mixtures of any one or more of these materials. Preferred examples of builder materials include sodium tripolyphosphate, mixtures thereof with sodium orthophosphate, sodium
 25 carbonate, mixtures thereof with calcite as a seed crystal, sodium citrate, zeolite and the sodium salt of nitrilotriacetic acid.

The level of builder material in the compositions of the invention may be up to 80% by weight, preferably from 20% to 70% by weight and most preferably from 30% to 60% by weight.

Apart from the components already mentioned, a detergent composition of the invention can contain
 30 any of the conventional additives in the amounts in which such additives are normally employed in fabric washing detergent compositions. Examples of these additives include the lather boosters such as alkanolamides, particularly the monoethanolamides derived from palm kernel fatty acids and coconut fatty acids, lather depressants, oxygen-releasing bleaching agents such as sodium perborate and sodium percarbonate, peracid bleach precursors, chlorine-releasing bleaching agents such as trichloroisocyanuric
 35 acid, inorganic salts such as sodium sulphate, and, usually present in very minor amounts, fluorescent agents, perfumes, other enzymes such as proteases and amylases, germicides and colourants.

We have found it particularly beneficial to include in the compositions of the invention an antistatic agent, to reduce the level of static on washed fabrics, especially those fabrics which include synthetic fibres, such as nylon.

The antistatic agents useful herein are quaternary ammonium salts of the formula $[R_1R_2R_3R_4N]^+Y^-$ wherein at least one, but not more than two, of R_1 , R_2 , R_3 and R_4 is an organic radical containing a group
 40 selected from a C_{16} - C_{22} aliphatic radical, or an alkyl phenyl or alkyl benzyl radical having 10-16 atoms in the alkyl chain, the remaining group or groups being selected from hydrocarbyl groups containing from 1 to about 4 carbon atoms, or C_2 - C_4 hydroxy alkyl groups and cyclic structures in which the nitrogen atom
 45 forms part of the ring, and Y is an anion such as halide, methylsulfate, or ethylsulfate.

In the context of the above definition, the hydrophobic moiety (ie, the C_{16} - C_{22} aliphatic, C_{10} - C_{16} alkyl phenyl or alkyl benzyl radical) in the organic radical R_1 may be directly attached to the quaternary nitrogen atom or may be indirectly attached thereto through an amide, esters, alkoxy, ether, or like grouping.

The quaternary ammonium antistatic agents can be prepared in various ways well known in the art.
 50 Many such materials are commercially available. The quaternaries are often made from alkyl halide mixtures corresponding to the mixed alkyl chain lengths in fatty acids. For example, the "ditallow" quaternaries are made from alkyl halides having mixed C_{14} - C_{18} chain lengths. Such mixed di-long chain quaternaries are useful herein and are preferred from a cost standpoint. Optionally, the tallow alkyl groups are hydrogenated or "hardened" to reduce the level of unsaturation and thereby raise the melting point and
 55 lower the water-solubility of compounds made therefrom. As used herein "ditallow" is intended to refer to the above-described ditallowalkyl quaternaries, either in their hardened or unhardened forms.

The quaternary ammonium antistatic compounds useful herein include both water-soluble and substantially water-insoluble materials. Imidazolinium compounds enumerated in US 3 936 537 (BASKERVILLE -

referred to above) possess appreciable water solubility and are preferably utilised in the present invention by mixing with an appropriate type and level of organic dispersion inhibitor and complexing component to give ultimate particle solubility in water of less than 50 ppm (parts per million) at 25 °C. Relatively water-soluble quaternary ammonium antistatic agents may also be of the nonring variety, such as diisostearyl dimethyl ammonium chlorides. Exemplary quaternary ammonium imidazolinium compounds are specifically methyl-1-alkylamidoethyl-2-alkyl imidazolinium methyl sulfates, specifically 1-methyl-1-[(tallowamido)ethyl]-2-tallowimidazolinium methyl sulfate. However, the most useful quaternary ammonium antistatic agents are characterised by relatively limited solubility in water.

The following are representative examples of substantially water-insoluble quaternary ammonium antistatic agents suitable for use in the compositions of the instant invention. Dioctadecyldimethyl ammonium chloride is an especially preferred quaternary antistatic agent for use herein by virtue of its high antistatic activity; ditallow dimethyl ammonium chloride is equally preferred because of its ready availability and its good antistatic activity; other useful di-long chain quaternary compounds are dicetyl dimethyl ammonium chloride; bis-docosyl dimethyl ammonium chloride; didodecyl dimethyl ammonium chloride; ditallow dimethyl ammonium bromide; dioleyol dimethyl ammonium hydroxide; ditallow dimethyl ammonium chloride; ditallow dipropyl ammonium bromide; ditallow dibutyl ammonium fluoride; cetyldecyl-methylethyl ammonium chloride; bis-[ditallow dimethyl- ammonium] sulfate; and tris-[ditallow dimethyl ammonium] phosphate.

The level of cationic antistatic agent should be sufficient to provide an antistatic benefit on synthetic fabrics. We have found that at least 1.0% by weight, most preferably at least 1.5% by weight of cationic antistatic agent is suitable. The compositions of the invention need not contain more than 10% by weight, generally not more than 6% by weight antistatic agent.

The compositions of the invention may also include organic amines. Suitable amines include primary, secondary and tertiary amines, such as hydrogenated tallow alkyl primary amine, secondary coconut methyl amine or methyl di-hardened tallow alkyl tertiary amine. The presence of such amines in the composition is known to enhance the perfume delivery to the fabrics. A suitable level for the amine in the composition is from 1.0% to 10%, most preferably 1.5% to 6% by weight.

PREPARATION OF THE COMPOSITION

The detergent compositions may be prepared in any way appropriate to their physical form such as by dry-mixing the components, co-agglomerating them or dispersing them in a liquid carrier. However, a preferred physical form is a granule incorporating a detergency builder material and this is most conveniently manufactured by spray-drying at least part of the composition.

The preferred compositions of the invention may be prepared by making up an aqueous slurry of the non-heat-sensitive components, comprising the anionic and/or nonionic surfactants, the clay-fabric softening material, the builder and filler salts together with any soil-suspending agents and optical brighteners, and spray-drying this slurry. The moisture content of the slurry is normally in the range of 28% to 36% and its temperature is conveniently in the range of 70 °C-95 °C. The spray-drying tower inlet temperatures are normally in the range of 300 °-360 °C and the resultant spray-dried granules have a moisture content of 8-12% by weight. An optional, but preferred, additional processing step is to cool the dried granules rapidly by means of cool air from a temperature of 90 °C to a temperature in the range of 25 °-35 °C, in order to facilitate the further processing of the product. Solid heat-sensitive components, such as persalts and enzymes, are mixed with the spray-dried granules. Although the cationic antistatic agent, if any, may be included in the slurry for spray-drying, this component may degrade under certain processing conditions and adversely affect product quality. It is therefore preferred that the antistatic agent if any be liquefied by melting or solvent dissolution and that this liquid be sprayed onto the spray-dried granules before or after other heat-sensitive solids have been dry-mixed with them. If the antistatic agent is applied as a melt, a liquid temperature of 5 °-30 °C in excess of the melting point can conveniently be used for the spray-on. When the antistatic agent is a waxy solid of rather low melting point, it may be blended with a compatible higher melting substance so as to ensure that granules sprayed on therewith are sufficiently crisp, are free-flowing and do not cake on storage. It is also possible to add the clay material as a granule, together with the solid heat-sensitive components to the spray-dried granules.

The invention is illustrated by the following non-limiting examples.

EXAMPLES 1 AND 2

A detergent composition was prepared by spray-drying the following components:

	Alkyl benzene sulphonate	5.5%
5	Ethoxylated alcohol	3.0%
	Soap	2.0%
	Sodium tripolyphosphate	30.0%
10	Sodium silicate	5.0%
	Sodium sulphate	8.0%
	Water and minor ingredients	11.5%

15 where the percentages quoted are based on the weight of the final product. To this spray-dried base powder was added 21.0% of sodium perborate tetrahydrate and 14% sodium sulphate. This composition was used as a control. Further compositions were prepared which included various amounts of clay and cellulase as set out below. These components were added to the spray dried base powder granules and the level of post-dosed sodium sulphate in the base powder was reduced accordingly.

20

Example No:	Control	A	B	C	1	2
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25

Cellulase	-	0.55%*	3.3%**	-	0.55%*	3.3%**
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Clay	-	-	-	10%	10%	10%
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* Cellulase added to give 10 Cx units/l in the wash
(pH 9.3).

30

** Cellulase added to give 60 Cx units/l in the wash
(pH 9.3).

35

These compositions were then used to wash pre-harshened terry towelling monitors. The product dosage was 5 g/l, the water hardness was 8° GH equivalent to about 1.36×10^{-3} molar free calcium ions and the pH of the wash liquor was approximately 9.3. A MIELE (Trade Mark) automatic washing machine was used on a 25°C to 40°C heat up cycle, heating up at 2°C/min. The wash time was 35 minutes. After washing the monitors were rinsed 3 times in tap water. After 5 washes the monitors were line-dried and then assessed for softness using a laboratory fabric softness measuring device. The results were as set out in the following Table, the softness of the monitors washed once in the control formulation being taken as 100%.

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	<u>Example No</u>	<u>% softness after 5 washes</u>
5	Control (after 1 wash)	100
	Control (after 5 washes)	103
	A	108
10	B	122
	C	111
	1	118
15	2	127

A comparison of the results obtained from all compositions relative to the control shows that both cellulase and clay improve the measured softening. A comparison of the results obtained from compositions A, C and Example 1 shows that the use of clay and cellulase together gives a softening benefit which is greater than the use of either softening component alone. A similar conclusion can be drawn from a comparison of compositions B, C and Example 2.

The cellulase used in these compositions was a granulated Humicola insolens cellulase SP 227 ex NOVO having an activity at pH 9.3 of 365 C_x units/gram. The clay used in these compositions was White Bentonite from Turkey, available from Steetley Minerals Limited, England which consists of about 95% clay mineral and has a cation exchange capacity of between 90 and 100 meq/100 g.

Similar results are obtained when additionally 4% by weight of dihardened tallow dimethyl ammonium chloride (AROSURF TA 100 - Trade Mark) are included as an antistatic agent, and antistatic tests on synthetic fabrics show a significant benefit over those compositions where no antistatic agent is present. Also, similar benefits for the combination of clay and cellulase occur when the phosphate containing base referred to above is replaced with a base containing zeolite and sodium carbonate but no phosphate.

EXAMPLES 3 AND 4

Using the same spray-dried base powder used in Examples 1 and 2, compositions were prepared having the following formulations (% by weight).

<u>Example No:</u>	<u>Control</u>	<u>D</u>	<u>E</u>	<u>3</u>	<u>F</u>	<u>G</u>	<u>4</u>
40	Base powder	65	65	65	65	65	65
	Clay - 1	-	10	10	10	-	-
	Clay - 2	-	-	-	10	10	10
45	Cellulase	-	-	1.0*	-	-	1.0*
	Alcalase	-	-	0.21**	-	0.21**	-
	Sodium perborate	21	21	21	21	21	21
50	Sodium sulphate	----- balance to 100% -----					
	* Cellulase added to give 10 Cx units/l in the wash						
55	** Alcalase added to give 10 gU/ml in the wash						

Clay No. 1 is a bentonite having a cation exchange capacity of 95 meg/100g while
Clay No. 2 is a bentonite having a cation exchange capacity of 31 meg/100g

Using the same evaluation method as described in connection with Examples 1 and 2 the softness of terry towelling monitors was assessed and the results were as follows:

5	Example No:	Control	D	E	3	F	G	4
	% softness	100	106	104	113	105	103	107

These results demonstrate that in the case of clay No. 1, in comparison with the Control, the presence of clay improves softening (Example D) and this softening is further improved by the additional presence of cellulase (Example 3) but not by the additional presence of alcalase (Example E). The same conclusion can be drawn from the results of those Examples which contain Clay No. 2. (Examples F, G and 4). It is also apparent from these results that Clay No. 1 shows improved results over Clay No. 2, particularly in the presence of cellulase (compare Examples 3 and 4).

Claims

1. A detergent composition for cleaning and softening fabrics comprising:
 - (i) a detergent active material;
 - (ii) a fabric softening clay material; and
 - (iii) cellulase.
2. A composition according to Claim 1, wherein the fabric softening clay material is a bentonitic clay.
3. A composition according to Claim 1, containing from 1.5% to 35% by weight of the fabric softening clay material.
4. A composition according to Claim 1, wherein the cellulase is selected from bacterial and fungal cellulases having a pH optimum of between 5 and 11.5.
5. A composition according to Claim 1, containing from 0.1 to 10% by weight of the cellulase.
6. A method of cleaning and softening fabrics comprising contacting the fabrics with a wash liquor to which has been added a detergent composition comprising a detergent active material, a fabric softening clay material and cellulase.
7. A method of preparing a detergent composition according to Claim 1, which method comprises forming an aqueous slurry of at least a detergent active material and a detergency builder material, spray-drying the slurry to form base granules and adding to the granules cellulase and a fabric softening clay material.
8. A method of preparing a detergent composition according to Claim 1, which method comprises forming an aqueous slurry of a detergent active and a fabric softening clay material, spray-drying the slurry to form base granules and adding cellulase to the base granules.

Revendications

1. Composition détergente pour nettoyer et adoucir des textiles comprenant :
 - (i) une matière détergente active ;
 - (ii) une argile d'adoucissement des textiles ; et
 - (iii) une cellulase
2. Composition selon la revendication 1, dans laquelle l'argile d'adoucissement de textiles est une argile bentonite.

3. Composition selon la revendication 1, qui contient de 1,5 à 35% en poids d'une argile d'adoucissement des textiles.
4. Composition selon la revendication 1, dans laquelle la cellulase est une cellulase bactérienne ou fongique ayant un pH optimal entre 5 et 11,5.
5. Composition selon la revendication 1, contenant de 0,1 à 10% en poids de cellulase.
6. Procédé de nettoyage et d'adoucissement de textiles, qui consiste à mettre les textiles en contact avec une liqueur de lavage additionnée d'une composition détergente comprenant une matière détergente active, une argile d'adoucissement de textiles et une cellulase.
7. Procédé de préparation d'une composition détergente selon la revendication 1, qui consiste à former une bouillie aqueuse d'au moins une matière détergente active et d'un adjuvant de détergence, à sécher par pulvérisation la bouillie pour former des granules de base et à ajouter aux granules la cellulase et l'argile d'adoucissement des textiles.
8. Procédé de préparation d'une composition détergente selon la revendication 1, qui consiste à former une bouillie aqueuse d'une matière détergente active et d'une argile d'adoucissement des textiles, à sécher la bouillie par pulvérisation pour former des granules de base et à ajouter la cellulase aux granules de base.

Ansprüche

1. Detergensenzusammensetzung zum Reinigen und Weichmachen von Textilien, umfassend
(i) Detergens-aktives Material,
(ii) Textil-weichmachendes Tonmaterial, und
(iii) Cellulase.
2. Zusammensetzung nach Anspruch 1, worin das Textil-weichmachende Tonmaterial ein Bentonitton ist.
3. Zusammensetzung nach Anspruch 1, enthaltend von 1,5 bis 35 Gewichtsprozent Textil-weichmachendes Tonmaterial .
4. Zusammensetzung nach Anspruch 1, worin die Cellulase ausgewählt ist aus Bakterien- und Pilzcellulase mit einem pH-Optimum zwischen 5 und 11,5.
5. Zusammensetzung nach Anspruch 1, enthaltend von 0,1 bis 10 Gewichts-% Cellulase
6. Verfahren zum Reinigen und Weichmachen von Textilien umfassend die Textilien mit einer Waschflüssigkeit in Berührung zu bringen, der eine Detergensenzusammensetzung zugegeben wurde, umfassend ein Detergens-aktives Material, ein Textil-weichmachendes Tonmaterial und Cellulase.
7. Verfahren zur Herstellung einer Detergensenzusammensetzung nach Anspruch 1, wobei das Verfahren das Bilden einer wässrigen Aufschlämmung von mindestens einem Detergensaktiven Material und einem Detergensgerüststoffmaterial, das Sprühtrocknen der Aufschlämmung, um ein Grundgranulat zu bilden, und das Zugeben von Cellulase und einem Textil-weichmachenden Tonmaterial zum Granulat umfaßt.
8. Verfahren zur Herstellung einer Detergensenzusammensetzung nach Anspruch 1, wobei das Verfahren das Bilden einer wässrigen Aufschlämmung eines Detergens-aktiven Materials und eines Textil-weichmachenden Tonmaterials, das Sprühtrocknen der Aufschlämmung um ein Grundgranulat zu bilden, und das Zusetzen von Cellulase zum Grundgranulat umfaßt.