



(11) **EP 3 390 601 B1**

(12) **EUROPEAN PATENT SPECIFICATION**

(45) Date of publication and mention
of the grant of the patent:
10.04.2019 Bulletin 2019/15

(21) Application number: **16802071.7**

(22) Date of filing: **29.11.2016**

(51) Int Cl.:
C11D 1/62 (2006.01) **C11D 3/00** (2006.01)
C11D 3/22 (2006.01) **C11D 3/37** (2006.01)
C11D 3/50 (2006.01) **C11D 11/00** (2006.01)
C11D 17/00 (2006.01)

(86) International application number:
PCT/EP2016/079112

(87) International publication number:
WO 2017/102306 (22.06.2017 Gazette 2017/25)

(54) **FABRIC CONDITIONING COMPOSITION**
GEWEBEPFLEGEZUSAMMENSETZUNG
COMPOSITION DE CONDITIONNEMENT DE TISSU

(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: **15.12.2015 EP 15200182**

(43) Date of publication of application:
24.10.2018 Bulletin 2018/43

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**AL AT BE BG CH CZ DE DK EE ES FI FR GR HR
HU IS IT LI LT LU LV MC MK NL NO PL PT RO RS
SE SI SK SM TR**

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Description**Technical Field**

[0001] The present invention relates to fabric conditioning compositions which have superior compatibility of components. The fabric conditioning composition comprises fabric softening active, cationic polysaccharide, non-ionic polysaccharide, a plurality of anionic microcapsules encapsulating a benefit agent and a cross linked, water swellable cationic co-polymer of at least one cationic monomer and optionally other non-ionic and/or anionic monomers.

Background to the Invention

[0002] The use of microcapsules encapsulating benefit agents, such as encapsulating perfumes, is advantageous in fabric conditioning compositions. Encapsulation provides improved stability in the composition and improved delivery of the benefit agent. However problems arise due to the poor dispersion or incompatibility of microcapsules in fabric conditioning compositions. This leads to aggregation and flocculation of the microcapsules. The result is poor visual appearance, and in-consistent product performance.

[0003] WO 2009/150017 discloses that addition of the encapsulated perfume to the water phase, prior to the addition of the molten active phase gives good dispersion and corresponding good visual properties. However this process is limiting and impacts the overall production of the laundry product.

[0004] WO2008005693 discloses a composition comprising: a) a microcapsule comprising a shell encapsulating a material having an average Clog P of at least about 2.5 and more than 60% by weight of the material has a Clog P of at least 3.3, and b) a cross-linked cationic polymer derived from the polymerization of about 5 to 100 mole percent of a cationic vinyl addition monomer, 0 to about 95 mole percent acrylamide, and about 5 to about 500 ppm of a difunctional vinyl addition monomer cross-linking agent.

[0005] We have surprisingly found that when cationic polysaccharide, non-ionic polysaccharide and a cross linked, water swellable cationic co-polymer of at least one cationic monomer and optionally other non-ionic and/or anionic monomers are used in a fabric conditioning composition, the requirement to mix the encapsulate with the water phase prior to the addition of the molten active phase is eliminated.

Statement of the Invention

[0006] In a first aspect of the invention is provided a fabric conditioning composition comprising;

- a. 0.5 to 20 wt. % of a fabric softening active, which is a quaternary ammonium compound;
- b. 0.01 to 2 wt. % Cationic polysaccharide;
- c. 0.01 to 2 wt. % Non-ionic polysaccharide;
- d. A plurality of anionic microcapsules encapsulating a benefit agent;
- e. 0.001 to 0.5 wt. % Cross linked, water swellable cationic co-polymer of at least one cationic monomer and optionally other non-ionic and/or anionic monomers; and
- f. Water.

[0007] In a second aspect of the current invention is provided a process for preparing a fabric conditioning composition as defined above, wherein the plurality of anionic microcapsules encapsulating a benefit agent and cross linked, water swellable cationic co-polymer of at least one cationic monomer and optionally other non-ionic and/or anionic monomers are combined in the presence of cationic polysaccharide and non-ionic polysaccharide.

Detailed Description of the Invention**Definitions**

[0008] The term "cationic polysaccharide" as used herein means a polysaccharide or a derivative thereof that has been chemically modified to provide the polysaccharide or the derivative thereof with a net positive charge in a pH neutral aqueous medium. The cationic polysaccharide may also include those that are non permanently charged, e.g. a derivative that can be cationic below a given pH and neutral above that pH. Non-modified polysaccharides, such as starch, cellulose, pectin, carageenan, guar, xanthans, dextrans, curdlans, chitosan, chitin, and the like, can be chemically modified to impart cationic charges thereon. A common chemical modification incorporates quaternary ammonium substituents to the polysaccharide backbones. Other suitable cationic substituents include primary, secondary or tertiary amino groups or quaternary sulfonium or phosphonium groups. Additional chemical modifications may include cross-linking, stabilization

reactions (such as alkylation and esterification), phosphorylations, hydrolyzations.

[0009] The term "nonionic polysaccharide" as used herein refers to a polysaccharide or a derivative thereof that has been chemically modified to provide the polysaccharide or the derivative thereof with a net neutral charge in a pH neutral aqueous medium; or a non-modified polysaccharide.

[0010] The term "anionic microcapsule" refers to the charge of the microcapsule prior to addition to the fabric conditioning composition. If supplied in a slurry this refers to the microcapsule charge in the slurry or if supplied dry, this refers to the charge of the dry microcapsule.

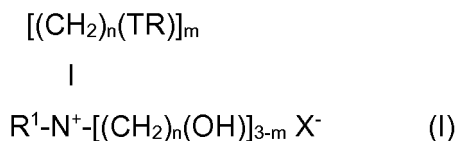
Fabric softening active

[0011] The fabric conditioning compositions of the invention contain 0.5 to 20 wt%, preferably from 1 to 11 wt%, more preferably 2 to 8 wt% softening active.

[0012] The softening active for use in rinse conditioner compositions of the invention is a quaternary ammonium compound (QAC). The preferred quaternary ammonium compounds for use in compositions of the present invention are the so called "ester quats" comprising an ester link. Particularly preferred materials are the ester-linked triethanolamine (TEA) quaternary ammonium compounds comprising a mixture of mono-, di- and tri-ester linked components. Most preferably the ester-linked quaternary ammonium compound is an ester-linked triethanolamine quaternary ammonium compound comprising unsaturated fatty chains.

[0013] Typically, TEA-based fabric softening actives comprise a mixture of mono, di- and tri-ester forms of the compound where the di-ester linked component comprises no more than 70 % by weight of the fabric softening compound, preferably no more than 60 %, e.g. 55 %, or 45 % of the fabric softening compound and at least 10 % of the monoester linked component, for example 11 % monoester. A preferred hardened type of active has a typical mono:di:tri ester distribution of from 18 to 22 monoester: from 58 to 62 diester: from 18 to 22 triester; for example 20:60:20. A soft TEA quat may have a typical mono:di:tri ester distribution of from 25 to 45 %, preferably from 30 to 40 % monoester: from 45 to 60 %, preferably from 50 to 55 % diester: and from 5 to 25 %, preferably from 10 to 15 % triester; for example 40:50:10.

[0014] A first group of quaternary ammonium compounds (QACs) suitable for use in the present invention is represented by formula (I):

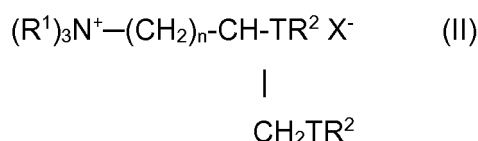


wherein each R is independently selected from a C₅₋₃₅ alkyl or alkenyl group; R¹ represents a C₁₋₄ alkyl, C₂₋₄ alkenyl or a C₁₋₄ hydroxyalkyl group; T is generally O-CO. (i.e. an ester group bound to R via its carbon atom), but may alternatively be CO-O (i.e. an ester group bound to R via its oxygen atom); n is a number selected from 1 to 4; m is a number selected from 1, 2, or 3; and X⁻ is an anionic counter-ion, such as a halide or alkyl sulphate, e.g. chloride or methylsulphate. Di-esters variants of formula I (i.e. m = 2) are preferred and typically have mono- and tri-ester analogues associated with them. Such materials are particularly suitable for use in the present invention.

[0015] Especially preferred agents are preparations which are rich in the di-esters of triethanolammonium methylsulphate, otherwise referred to as "TEA ester quats".

[0016] Commercial examples include Stepantex™ UL85, ex Stepan, Prapagen™ TQL, ex Clariant, and Tetranyl™ AHT-1, ex Kao, (both di-[hardened tallow ester] of triethanolammonium methylsulphate), AT-1 (di-[tallow ester] of triethanolammonium methylsulphate), and L5/90 (di-[palm ester] of triethanolammonium methylsulphate), both ex Kao, and Rewoquat™ WE15 (a di-ester of triethanolammonium methylsulphate having fatty acyl residues deriving from C₁₀-C₂₀ and C₁₆-C₁₈ unsaturated fatty acids), ex Evonik. Also suitable are soft quaternary ammonium actives such as Stepantex VK90, Stepantex VT90, SP88 (ex-Stepan), Ceca Noramine, Prapagen TQ (ex-Clariant), Dehyquart AU-57 (ex-Cognis), Rewoquat WE18 (ex-Degussa) and Tetranyl L190 P, Tetranyl L190 SP and Tetranyl L190 S (all ex-Kao).

[0017] A second group of QACs suitable for use in the invention is represented by formula (II):

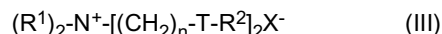


wherein each R¹ group is independently selected from C₁₋₄ alkyl, hydroxyalkyl or C₂₋₄ alkenyl groups; and wherein each

R² group is independently selected from C₈₋₂₈ alkyl or alkenyl groups; and wherein n, T, and X⁻ are as defined above.

[0018] Preferred materials of this second group include 1,2 *bis*[tallowoyloxy]-3-trimethylammonium propane chloride, 1,2 *bis*[hardened tallowoyloxy]-3-trimethylammonium propane chloride, 1,2-*bis*[oleoyloxy]-3-trimethylammonium propane chloride, and 1,2 *bis*[stearoyloxy]-3-trimethylammonium propane chloride. Such materials are described in US 4,137,180 (Lever Brothers). Preferably, these materials also comprise an amount of the corresponding mono-ester.

[0019] A third group of QACs suitable for use in the invention is represented by formula (III):



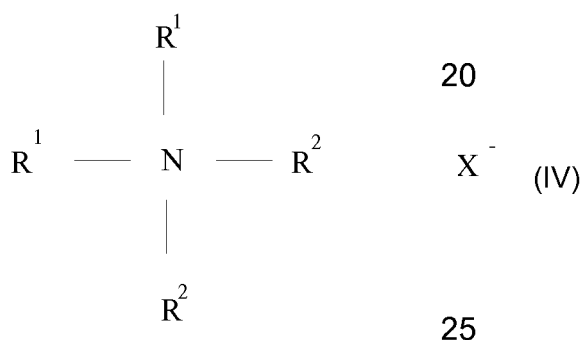
wherein each R¹ group is independently selected from C₁₋₄ alkyl, or C₂₋₄ alkenyl groups; and wherein each R² group is independently selected from C₈₋₂₈ alkyl or alkenyl groups; and n, T, and X⁻ are as defined above. Preferred materials of this third group include bis(2-tallowoyloxyethyl)dimethyl ammonium chloride and hardened versions thereof.

[0020] The iodine value of the quaternary ammonium fabric conditioning material is preferably from 0 to 80, more preferably from 0 to 60, and most preferably from 0 to 45. The iodine value may be chosen as appropriate. Essentially saturated material having an iodine value of from 0 to 5, preferably from 0 to 1 may be used in the compositions of the invention. Such materials are known as "hardened" quaternary ammonium compounds.

[0021] A further preferred range of iodine values is from 20 to 60, preferably 25 to 50, more preferably from 30 to 45. A material of this type is a "soft" triethanolamine quaternary ammonium compound, preferably triethanolamine di-alkylester methylsulphate. Such ester-linked triethanolamine quaternary ammonium compounds comprise unsaturated fatty chains.

[0022] Iodine value as used in the context of the present invention refers to, the fatty acid used to produce the QAC, the measurement of the degree of unsaturation present in a material by a method of nmr spectroscopy as described in Anal. Chem., 34, 1136 (1962) Johnson and Shoolery.

[0023] A further type of softening compound may be a non-ester quaternary ammonium material represented by formula (IV):



wherein each R¹ group is independently selected from C₁₋₄ alkyl, hydroxyalkyl or C₂₋₄ alkenyl groups; each R² group is independently selected from C₈₋₂₈ alkyl or alkenyl groups, and X⁻ is as defined above.

[0024] The compositions of the invention may optionally contain a non-cationic softening material, which is preferably an oily sugar derivative. An oily sugar derivative is a liquid or soft solid derivative of a cyclic polyol (CPE) or of a reduced saccharide (RSE), said derivative resulting from 35 to 100 % of the hydroxyl groups in said polyol or in said saccharide being esterified or etherified. The derivative has two or more ester or ether groups independently attached to a C₈-C₂₂ alkyl or alkenyl chain.

[0025] Advantageously, the CPE or RSE does not have any substantial crystalline character at 20°C. Instead it is preferably in a liquid or soft solid state as herein defined at 20°C.

[0026] The liquid or soft solid (as hereinafter defined) CPEs or RSEs suitable for use in the present invention result from 35 to 100% of the hydroxyl groups of the starting cyclic polyol or reduced saccharide being esterified or etherified with groups such that the CPEs or RSEs are in the required liquid or soft solid state. These groups typically contain unsaturation, branching or mixed chain lengths.

[0027] Typically the CPEs or RSEs have 3 or more ester or ether groups or mixtures thereof, for example 3 to 8, especially 3 to 5. It is preferred if two or more of the ester or ether groups of the CPE or RSE are independently of one another attached to a C₈ to C₂₂ alkyl or alkenyl chain. The C₈ to C₂₂ alkyl or alkenyl groups may be branched or linear carbon chains.

[0028] Preferably 35 to 85 % of the hydroxyl groups, most preferably 40-80 %, even more preferably 45-75 %, such as 45-70 % are esterified or etherified.

[0029] Preferably the CPE or RSE contains at least 35 % tri or higher esters, e.g. at least 40 %.

[0030] The CPE or RSE has at least one of the chains independently attached to the ester or ether groups having at least one unsaturated bond. This provides a cost effective way of making the CPE or RSE a liquid or a soft solid. It is preferred if predominantly unsaturated fatty chains, derived from, for example, rape oil, cotton seed oil, soybean oil, oleic, tallow, palmitoleic, linoleic, erucic or other sources of unsaturated vegetable fatty acids, are attached to the ester/ether groups.

[0031] These chains are referred to below as the ester or ether chains (of the CPE or RSE).

[0032] The ester or ether chains of the CPE or RSE are preferably predominantly unsaturated. Preferred CPEs or RSEs include sucrose tetrataallowate, sucrose tetrarapeate, sucrose tetraoleate, sucrose tetraesters of soybean oil or cotton seed oil, cellobiose tetraoleate, sucrose trioleate, sucrose triapeate, sucrose pentaoleate, sucrose pentarapeate, sucrose hexaoleate, sucrose hexarapeate, sucrose triesters, pentaesters and hexaesters of soybean oil or cotton seed oil, glucose tiroleate, glucose tetraoleate, xylose trioleate, or sucrose tetra-, tri-, penta- or hexa- esters with any mixture of predominantly unsaturated fatty acid chains. The most preferred CPEs or RSEs are those with monounsaturated fatty acid chains, i.e. where any polyunsaturation has been removed by partial hydrogenation. However some CPEs or RSEs based on polyunsaturated fatty acid chains, e.g. sucrose tetralinoleate, may be used provided most of the polyunsaturation has been removed by partial hydrogenation.

[0033] The most highly preferred liquid CPEs or RSEs are any of the above but where the polyunsaturation has been removed through partial hydrogenation. Preferably 40 % or more of the fatty acid chains contain an unsaturated bond, more preferably 50 % or more, most preferably 60 % or more. In most cases 65 % to 100 %, e.g. 65 % to 95 % contain an unsaturated bond.

[0034] CPEs are preferred for use with the present invention. Inositol is a preferred example of a cyclic polyol. Inositol derivatives are especially preferred.

[0035] In the context of the present invention, the term cyclic polyol encompasses all forms of saccharides. Indeed saccharides are especially preferred for use with this invention. Examples of preferred saccharides for the CPEs or RSEs to be derived from are monosaccharides and disaccharides.

[0036] Examples of monosaccharides include xylose, arabinose, galactose, fructose, sorbose and glucose. Glucose is especially preferred. Examples of disaccharides include maltose, lactose, cellobiose and sucrose. Sucrose is especially preferred. An example of a reduced saccharide is sorbitan.

[0037] The liquid or soft solid CPEs can be prepared by methods well known to those skilled in the art. These include acylation of the cyclic polyol or reduced saccharide with an acid chloride; trans-esterification of the cyclic polyol or reduced saccharide fatty acid esters using a variety of catalysts; acylation of the cyclic polyol or reduced saccharide with an acid anhydride and acylation of the cyclic polyol or reduced saccharide with a fatty acid. See for instance US 4 386 213 and AU 14416/88 (both P&G).

[0038] It is preferred if the CPE or RSE has 3 or more, preferably 4 or more ester or ether groups. If the CPE is a disaccharide it is preferred if the disaccharide has 3 or more ester or ether groups. Particularly preferred CPEs are esters with a degree of esterification of 3 to 5, for example, sucrose tri, tetra and penta esters.

[0039] Where the cyclic polyol is a reducing sugar it is advantageous if each ring of the CPE has one ether or ester group, preferably at the C₁ position. Suitable examples of such compounds include methyl glucose derivatives.

[0040] Examples of suitable CPEs include esters of alkyl(poly)glucosides, in particular alkyl glucoside esters having a degree of polymerisation from 1 to 2.

[0041] The length of the unsaturated (and saturated if present) chains in the CPE or RSE is C_s-C₂₂, preferably C₁₂-C₂₂. It is possible to include one or more chains of C₁-C₈, however these are less preferred.

[0042] The liquid or soft solid CPEs or RSEs which are suitable for use in the present invention are characterised as materials having a solid:liquid ratio of between 50:50 and 0:100 at 20°C as determined by T₂ relaxation time NMR, preferably between 43:57 and 0:100, most preferably between 40:60 and 0:100, such as, 20:80 and 0:100. The T₂ NMR relaxation time is commonly used for characterising solid:liquid ratios in soft solid products such as fats and margarines. For the purpose of the present invention, any component of the signal with a T₂ of less than 100 μs is considered to be a solid component and any component with T₂ ≥ 100 μs is considered to be a liquid component. For the CPEs and RSEs, the prefixes (e.g. tetra and penta) only indicate the average degrees of esterification. The compounds exist as a mixture of materials ranging from the monoester to the fully esterified ester. It is the average degree of esterification which is used herein to define the CPEs and RSEs.

[0043] The HLB of the CPE or RSE is typically between 1 and 3.

[0044] Where present, the CPE or RSE is preferably present in the composition in an amount of 0.5-50% by weight, based upon the total weight of the composition, more preferably 1-30% by weight, such as 2-25%, e.g. 2-20%.

[0045] The CPEs and RSEs for use in the compositions of the invention include sucrose tetraoleate, sucrose pentaerucate, sucrose tetraerucate and sucrose pentaoleate.

Cationic polysaccharide and non-ionic polysaccharide

[0046] According to the present invention, the fabric conditioner composition comprises cationic polysaccharide and non-ionic polysaccharide. In one embodiment, these are pre-mixed prior to addition to the composition and in another embodiment these components are added separately. Preferably the cationic polysaccharide and non-ionic polysaccharide are mixed prior to addition to the fabric conditioner composition.

Cationic Polysaccharide

[0047] The cationic polysaccharide comprises at least one cationic polysaccharide. The cationic polysaccharide can be obtained by chemically modifying polysaccharides, generally natural polysaccharides. By such modification, cationic side groups can be introduced into the polysaccharide backbone. In one embodiment, the cationic groups borne by the cationic polysaccharide according to the present invention are quaternary ammonium groups.

[0048] The cationic polysaccharides of the present invention include but are not limited to: cationic cellulose and derivatives thereof, cationic starch and derivatives thereof, cationic callose and derivatives thereof, cationic xylan and derivatives thereof, cationic mannan and derivatives thereof, cationic galactomannan and derivatives thereof, such as cationic guar and derivatives thereof.

[0049] Cationic celluloses suitable for the present invention include cellulose ethers comprising quaternary ammonium groups, cationic cellulose copolymers or celluloses grafted with a water-soluble quaternary ammonium monomer.

[0050] The cellulose ethers comprising quaternary ammonium groups are described in French patent 1,492,597 and in particular include the polymers sold under the names "JR" (JR 400, JR 125, JR 30M) or "LR" (LR 400, LR 30M) by the company Dow. These polymers are also defined in the CTFA dictionary as hydroxyethylcellulose quaternary ammoniums that have reacted with an epoxide substituted with a trimethylammonium group. Suitable cationic celluloses also include LR3000 KC from company Solvay.

[0051] The cationic cellulose copolymers or the celluloses grafted with a water-soluble quaternary ammonium monomer are described especially in patent U.S. Pat. No. 4,131,576, such as hydroxyalkylcelluloses, for instance hydroxymethyl-, hydroxyethyl- or hydroxypropylcelluloses grafted especially with a methacryloyl-ethyltrimethylammonium, methacrylamidopropyltrimethylammonium or dimethyl-diallylammonium salt. The commercial products corresponding to this definition are more particularly the products sold under the names Celquat® L 200 and Celquat® H 100 by the company Akzo Nobel.

[0052] Cationic starches suitable for the present invention include the products sold under Polygelo® (cationic starches from Sigma), the products sold under Softgel®, Amylofax® and Solvitose® (cationic starches from Avebe), CATO from National Starch.

[0053] Suitable cationic galactomannans can be those derived from Fenugreek Gum, Konjac Gum, Tara Gum, Cassia Gum or Guar Gum.

[0054] It is preferred that the cationic polysaccharide is a cationic guar. Guars are polysaccharides composed of the sugars galactose and mannose. The backbone is a linear chain of β 1,4-linked mannose residues to which galactose residues are 1,6-linked at every second mannose in average, forming short side units. Within the context of the present invention, the cationic guars are cationic derivatives of guars.

[0055] In the case of the cationic polysaccharide, such as the cationic guar, the cationic group may be a quaternary ammonium group bearing 3 radicals, which may be identical or different, preferably chosen from hydrogen, alkyl, hydroxyalkyl, epoxyalkyl, alkenyl, or aryl, preferably containing 1 to 22 carbon atoms, more particularly 1 to 14 and advantageously 1 to 3 carbon atoms. The counterion is generally a halogen. One example of the halogen is chlorine.

[0056] Examples of the quaternary ammonium group include : 3-chloro-2-hydroxypropyl trimethyl ammonium chloride (CHPTMAC), 2,3-epoxypropyl trimethyl ammonium chloride (EPTAC), diallyldimethyl ammonium chloride (DMDAAC), vinylbenzene trimethyl ammonium chloride, trimethylammonium ethyl metacrylate chloride, methacrylamidopropyltrimethyl ammonium chloride (MAPTAC), and tetraalkylammonium chloride.

[0057] One example of the cationic functional group in the cationic polysaccharides, such as the cationic guars, is trimethylamino(2-hydroxy)propyl, with a counter ion. Various counter ions can be utilized, including but not limited to halides, such as chloride, fluoride, bromide, and iodide, sulfate, nitrate, methylsulfate, and mixtures thereof.

[0058] The cationic guars of the present invention may be chosen from the group consisting of: cationic hydroxyalkyl guars, such as cationic hydroxyethyl guar, cationic hydroxypropyl guar, cationic hydroxybutyl guar, and cationic carboxyalkyl guars including cationic carboxymethyl guar, cationic alkylcarboxy guars such as cationic carboxylpropyl guar and cationic carboxybutyl guar, cationic carboxymethylhydroxypropyl guar.

[0059] In one exemplary embodiment, the cationic polysaccharide of the present invention is guar hydroxypropyltrimonium chloride or hydroxypropyl guar hydroxypropyltrimonium chloride.

[0060] The cationic polysaccharide, of the present invention may have an average Molecular Weight (Mw) of between 100,000 daltons and 3,500,000 daltons, preferably between 100,000 daltons and 1,500,000 daltons, more preferably

between 100,000 daltons and 1,000,000 daltons.

[0061] The composition of the present invention comprises from 0.01 to 2 wt % of cationic polysaccharide based on the total weight of the composition. More preferably, 0.025 to 1 wt % of cationic polysaccharide based on the total weight of the composition. Most preferably, 0.04 to 0.8 wt % of cationic polysaccharide based on the total weight of the composition.

[0062] In the context of the present application, the term "Degree of Substitution (DS)" of cationic polysaccharides, such as cationic guar, is the average number of hydroxyl groups substituted per sugar unit. DS may notably represent the number of the carboxymethyl groups per sugar unit. DS may be determined by titration.

[0063] The DS of the cationic polysaccharide, is preferably in the range of 0.01 to 1, more preferably 0.05 to 1, most preferably 0.05 to 0.2.

[0064] In the context of the present application, "Charge Density (CD)" of cationic polysaccharides, such as cationic guar, means the ratio of the number of positive charges on a monomeric unit of which a polymer is comprised to the molecular weight of said monomeric unit.

[0065] CD of the cationic polysaccharide, such as the cationic guar, is preferably in the range of 0.1 to 3 (meq/gm), more preferably 0.1 to 2 (meq/gm), most preferably 0.1 to 1 (meq/gm).

Non-ionic polysaccharide

[0066] The non-ionic polysaccharide comprises at least one non-ionic polysaccharide. The nonionic polysaccharide can be a modified nonionic polysaccharide or a non-modified nonionic polysaccharide. The modified non-ionic polysaccharide may comprise hydroxyalkylation and/or esterification.

[0067] In the context of the present application, the level of modification of non-ionic polysaccharides can be characterized by Molar Substitution (MS), which means the average number of moles of substituents, such as hydroxypropyl groups, per mole of the monosaccharide unit. MS can be determined by the Zeisel-GC method, notably based on the following literature reference: K. L. Hodges, W. E. Kester, D. L. Wiederrich, and J. A. Grover, "Determination of Alkoxy Substitution in Cellulose Ethers by Zeisel-Gas Chromatography", Analytical Chemistry, Vol. 51, No. 13, November 1979. Preferably, the MS of the modified nonionic polysaccharide is in the range of 0 to 3, more preferably 0.1 to 3 and most preferably 0.1 to 2.

[0068] The nonionic polysaccharide of the present invention may be especially chosen from glucans, modified or non-modified starches (such as those derived, for example, from cereals, for instance wheat, corn or rice, from vegetables, for instance yellow pea, and tubers, for instance potato or cassava), amylose, amylopectin, glycogen, dextrans, celluloses and derivatives thereof (methylcelluloses, hydroxyalkylcelluloses, ethylhydroxyethylcelluloses), mannans, xylans, lignins, arabans, galactans, galacturonans, chitin, chitosans, glucuronoxylans, arabinoxylans, xyloglucans, glucomannans, pectic acids and pectins, arabinogalactans, carrageenans, agars, gum arabics, gum tragacanth, ghatti gums, karaya gums, carob gums, galactomannans such as guar and nonionic derivatives thereof (hydroxypropyl guar), and mixtures thereof. Among the celluloses that are especially used are hydroxyethylcelluloses and hydroxypropylcelluloses. Mention may be made of the products sold under the names Klucel® EF, Klucel® H, Klucel® LHF, Klucel® MF and Klucel® G by the company Aqualon, and Cellosize® Polymer PCG-10 by the company Amerchol, and HEC, HPMC K200, HPMC K35M by the company Ashland.

[0069] It is preferred that the nonionic polysaccharide is a nonionic guar. The nonionic guar can be modified or non-modified. The non-modified nonionic guar includes the products sold under the name Vidogum® GH 175 by the company Unipeptine and under the names Meypro®-Guar 50 and Jaguar® C by the company Solvay. The modified nonionic guar is especially modified with C1-C6 hydroxyalkyl groups. Among the hydroxyalkyl groups that may be mentioned, for example, are hydroxymethyl, hydroxyethyl, hydroxypropyl and hydroxybutyl groups. These guar are well known in the prior art and can be prepared, for example, by reacting the corresponding alkene oxides such as, for example, propylene oxides, with the guar so as to obtain a guar modified with hydroxypropyl groups.

[0070] The nonionic polysaccharide, such as the nonionic guar, of the present invention may have an average Molecular Weight (Mw) of between 100,000 daltons and 3,500,000 daltons, preferably between 500,000 daltons and 3,500,000 daltons.

[0071] The composition of the present invention comprises from 0.01 to 2 wt % of non-ionic polysaccharide based on the total weight of the composition. More preferably, 0.025 to 1 wt % of non-ionic polysaccharide based on the total weight of the composition. Most preferably, 0.04 to 0.8 wt % of non-ionic polysaccharide based on the total weight of the composition.

[0072] Preferably the fabric conditioning composition comprises combined weight of the cationic polysaccharide and non-ionic polysaccharide of 0.02 to 4 w.t. %, more preferably 0.05 to 2 w.t. % and most preferably 0.08 to 1.6 w.t. %.

[0073] Preferably the ratio of the weight of the cationic polysaccharide in the composition and the weight of the nonionic polysaccharide in the composition is between 1:10 and 10:1, more preferably, between 1:3 and 3:1.

[0074] In a preferred embodiment, the cationic polysaccharide and non-ionic polysaccharide are mixed prior to addition

to the fabric conditioner composition. Preferably the mix is prepared as a suspension in water.

[0075] Preferably, the ratio of the weight of the quaternary ammonium compound in the composition and the total weight of the cationic polysaccharide and the nonionic polysaccharide in the composition is between 100:1 and 2:1, more preferably, between 30:1 and 5:1.

Plurality of anionic microcapsules encapsulating a benefit agent

[0076] The anionic microcapsules of the present invention are anionic microcapsules encapsulating a benefit agent comprise a core and a shell. The microcapsule may be in a slurry or may be a dry composition. Prior to addition to the fabric conditioning composition the individual microcapsules have an anionic charge.

[0077] The microcapsules of the current invention are preferably pressure activated which is also referred to as friable.

[0078] The shell comprises a suitable encapsulating material, examples of which include aminoplasts, proteins, polyurethanes, polyacrylates, polymethacrylates, polysaccharides, polyamides, polyolefins, gums, silicones, lipids, modified cellulose, polyphosphate, polystyrene, polyesters or combinations of these materials.

[0079] Additionally, microcapsules made via the simple or complex coacervation of gelatin may be used. Microcapsules having shells comprised of polyurethane, polyamide, polyolefin, polysaccharide, protein, silicone, lipid, gums, polyacrylate, polystyrene, and polyesters or combinations of these materials may also be used.

[0080] Preferably the shell encapsulating polymers comprise aminoplast polymers, more preferably the aminoplast polymers comprise melamine formaldehyde or urea formaldehyde condensates, or co-polyacrylamide/acrylate with a methylated melamine crosslinker. Most preferably the encapsulating shell comprises melamine formaldehyde.

[0081] Encapsulation can provide pore vacancies or interstitial openings depending on the encapsulation techniques employed.

[0082] Fragrance capsules known in the art and suitable for use in the present invention comprise a shell comprising a three-dimensional cross-linked network of an aminoplast resin, more specifically a substituted or un-substituted acrylic acid polymer or co-polymer cross-linked with a urea-formaldehyde pre-condensate or a melamine-formaldehyde pre-condensate.

[0083] For liquid compositions, the capsules may be used in the form of a slurry, which preferably comprises about 40% solids. The amount of such a 40% capsule slurry to be used in a composition is up to 10%, preferably from 0.1 to 5 %, more preferably from 0.5 to 2 % by weight of the total composition.

[0084] Particle size and average diameter of the capsules can vary from about 10 nanometers to about 1000 microns, preferably from about 50 nanometers to about 100 microns, more preferably from about 2 to about 40 microns, even more preferably from about 4 to 15 microns. A particularly preferred range is from about 5 to 10 microns, for example 6 to 7 microns. The capsule distribution can be narrow, broad or multimodal. Multimodal distributions may be composed of different types of capsule chemistries.

[0085] In the compositions described herein, benefit agents are hydrophobic materials that can provide a beneficial effect to a fabric.

[0086] The preferred benefit agents according to the present invention have a ClogP greater than 0.5.

[0087] Preferred benefit agents include perfumes, lubricants and any other oily materials. Particularly preferred benefit agents include, but are not limited to, the following:

- a) silicone oils, resins, and modifications thereof such as linear and cyclic polydimethylsiloxanes, amino-modified, allyl, aryl, and alkylaryl silicone oils, which preferably have a viscosity of greater than 0.05 m²/s (50,000 cst);
- b) perfume components including fragrance, perfumery, and essential oils and resins, aromatherapy actives and pro-fragrance materials;
- c) insect repellants
- d) organic sunscreen actives, for example, octylmethoxy cinnamate;
- e) antimicrobial agents, for example, 2-hydroxy-4, 2,4- trichlorodiphenylether;
- f) ester solvents; for example, isopropyl myristate;
- g) lipids and lipid like substance, for example, cholesterol;
- h) hydrocarbons such as paraffins, petrolatum, and mineral oil
- i) fish and vegetable oils;
- j) hydrophobic plant extracts;
- k) waxes;
- l) pigments including inorganic compounds with hydrophobically- modified surface and/ or dispersed in an oil or a hydrophobic liquid, and;
- m) sugar-esters, such as sucrose polyester (SPE).

[0088] The most preferred benefit agents are perfume components. Perfume components include both odiferous

materials and pro-fragrance materials.

[0089] The total amount of benefit agent is preferably from 0.01 to 10% by weight, more preferably from 0.05 to 5 % by weight, even more preferably from 0.1 to 4.0 %, most preferably from 0.15 to 4.0 % by weight, based on the total weight of the fabric conditioner composition.

[0090] The capsules for use in the invention may further comprise a carrier oil in the core. The carrier oils are hydrophobic materials that are miscible in the volatile benefit agent materials used in the present invention. Suitable oils are those having reasonable affinity for the benefit agent. Where the benefit agent is a perfume, suitable materials include, but are not limited to triglyceride oil, mono and diglycerides, mineral oil, silicone oil, diethyl phthalate, polyalpha olefins, castor oil and isopropyl myristate. Preferably, the oil is a triglyceride oil, most preferably a capric/caprylic triglyceride oil.

[0091] The anionic microcapsule may further comprise a coating on the encapsulating shell material and/or a deposition aid which may be covalently attached.

[0092] The anionic microcapsules of the present invention may comprise a mix of microcapsules comprising different shell materials and/or different benefit agents.

Cross linked, water swellable cationic co-polymer

[0093] The compositions of the present invention comprise a crosslinked water swellable cationic copolymers of at least one cationic monomer and optionally other non-ionic and/or anionic monomers. Preferred polymers of this type are copolymers of acrylamide and methacrylate, more preferably copolymers of acrylamide and trimethylaminoethyl-acrylate chloride.

[0094] The composition may comprise one crosslinked water swellable cationic copolymer. In one embodiment of the invention it may be preferred that the composition comprises at least two different crosslinked water swellable cationic copolymers.

[0095] Preferred polymers comprise less than 25 % of water soluble polymers by weight of the total polymer, preferably less than 20 %, and most preferably less than 15 %, and a cross-linking agent concentration of from 500 ppm to 5000 ppm by weight relative to the polymer, preferably from 750 ppm to 5000 ppm by weight, more preferably from 1000 to 4500 ppm by weight as determined by a suitable metering method such as the following method described on page 4 of patent EP 2373773 B1.

[0096] This method is based on the separation of cross linked polymer microgels from a solution of polymer by centrifugation. The polymer content before and after centrifugation is determined by colloid titration, based on the stoichiometric precipitation of charged colloidal particles by titration with oppositely charged polymer using a visual indicator.

[0097] About 20 grams of a dispersion of the polymer in non-aqueous liquid is accurately weighed and added to 200 ml acetone with stirring at room temperature. Stirring is continued for 5 minutes and then the precipitated polymer is filtered through no. 1 filter paper, air dried for 1 hour in drying oven then dried at 50°C for 2 hours, cooled in a dessicator and weighed. The percentage of polymer in the starting dispersion can thus be calculated.

[0098] Enough of this dispersion is added to deionised water with stirring to produce about 200g viscous paste containing 0.5% by weight polymer. This is stirred at about 500 rpm for 45 minute using 3 blades impeller.

[0099] To 40 grams of this paste are added 210 g deionised water containing dissolved therein 1.0 g sodium chloride and the mixture is carefully mixed for 5 minutes to reduce the viscosity for centrifugation.

[0100] Nalgene centrifuge tubes are filled and balanced by weighing with the polymer solution (using about 40ml) and centrifuged for 1.5 hours (15300 rpm). The top 5 g of supernatant polymer solution are carefully pipetted off. The supernatant polymer solution and a sample of the entire aqueous composition prior to centrifugation are subjected to colloid titration to determine the amount of soluble polymer in the supernatant liquor after centrifuging. Thus it gives a value for the percentage of soluble polymer in the initial polymer.

[0101] The colloid titration is performed as follows:

- Potassium polyvinyl sulphate (PVSK): 0.0025N solution.
- Chlorhydric acid: 0.1 N solution to adjust.
- Toluidine blue indicator: 0.1% solution.

[0102] Titration is run on polymer solution acidified with chlorhydric acid (pH about 4) and coloured with 2-3 droplet of blue indicator. PVSK is added slowly until the colour turns from blue to violet.

[0103] % of solubles is then determined according to volume of PVSK measured at equilibrium, polymer weight, corresponding dilution and reagents molarity.

[0104] The cross-linking agent concentration must be higher than about 500 ppm by weight relative to the polymer and preferably higher than about 750 ppm by weight when the crosslinking agent used is the methylene bisacrylamide, or other cross-linking agents at concentrations that lead to equivalent cross-linking levels of from 10 to 10,000 ppm by weight.

[0105] Suitable cationic monomers are selected from the group consisting of the following monomers and derivatives and their quaternary or acid salts:

dimethylaminopropylmethacrylamide, dimethylaminopropylacrylamide, diallylamine, methyldiallylamine, dialkylaminoalkyl-acrylates and methacrylates, dialkylaminoalkyl-acrylamides or -methacrylamides.

[0106] Following is a non-restrictive list of monomers performing a non-ionic function: acrylamide, methacrylamide, N-Alkyl acrylamide, N-vinyl pyrrolidone, N-vinyl formamide, N-vinyl acetamide, vinylacetate, vinyl alcohol, acrylate esters, allyl alcohol.

[0107] Following is a non-restrictive list of monomers performing an anionic function: acrylic acid, methacrylic acid, itaconic acid, crotonic acid, maleic acid, fumaric acid, as well as monomers performing a sulfonic acid or phosphonic acid functions, such as 2-acrylamido-2-methyl propane sulfonic acid (ATBS) etc.

[0108] The monomers may also contain hydrophobic groups.

[0109] Following is a non-restrictive list of cross-linking agents: methylene bisacrylamide (MBA), ethylene glycol diacrylate, polyethylene glycol dimethacrylate, diacrylamide, triallylamine, cyanomethylacrylate, vinyl oxyethylacrylate or methacrylate and formaldehyde, glyoxal, compounds of the glycidyl ether type such as ethyleneglycol diglycidyl ether, or the epoxydes or any other means familiar to the expert permitting cross-linking.

[0110] By way of preeminent preference the cross-linking rate preferably ranges from 800 to 5000 ppm (on the basis of methylene bisacrylamide) by weight relative to the polymer or equivalent cross-linking with a cross-linking agent of different efficiency.

[0111] As described in US 2002/0132749 and Research Disclosure 429116, the degree of nonlinearity can additionally be controlled by the inclusion of chain transfer agents (such as isopropyl alcohol, sodium hypophosphite, mercaptoethanol) in the polymerisation mixture in order to control the polymeric chain's length and the cross-linking density.

[0112] The amount of polymer used in the compositions of the invention is from 0.001 to 0.5 wt %, preferably from 0.005 to 0.4 wt %, more preferably from 0.05 to 0.35 wt % and most preferably from 0.1 to 0.25 wt %, by weight of the total composition.

[0113] An example of a preferred polymer is Flosoft 270LS ex SNF and Flosoft 222 ex SNF.

Optional ingredients

[0114] Silicone based fabric softening agents (and other non quat softening compounds) When the invention is in the form of a fabric conditioning composition, the invention may further contain a silicone based fabric softening agent. Preferably the fabric softening silicone is a polydimethylsiloxane.

[0115] The fabric softening silicones include but are not limited to 1) non-functionalized silicones such as polydimethylsiloxane (PDMS) or alkyl (or alkoxy) functional silicones 2) functionalized silicones or copolymers with one or more different types of functional groups such as amino, phenyl, polyether, acrylate, siliconhydride, carboxylic acid, quaternized nitrogen, etc.

[0116] Suitable silicones may be selected from polydialkylsiloxanes, preferably polydimethylsiloxane more preferably amino functionalised silicones; anionic silicones and carboxyl functionalised silicone.

[0117] An amino silicone that may also be used, for example, Arristan 64, ex CHT or Wacker CT45E, ex Wacker.

[0118] In terms of silicone emulsions, the particle size can be in the range from about 1 nm to 100 microns and preferably from about 10 nm to about 10 microns including microemulsions (< 150 nm), standard emulsions (about 200 nm to about 500 nm) and macroemulsions (about 1 micron to about 20 microns).

[0119] Polyalkyl wax emulsions, for example polyethylene wax may also be used as softening agents in the composition of the invention.

Co-softeners and fatty complexing agents

[0120] Co-softeners may be used. When employed, they are typically present at from 0.1 to 20% and particularly at from 0.3 to 10%, based on the total weight of the composition. Preferred co-softeners include fatty esters, and fatty N-oxides. Fatty esters that may be employed include fatty monoesters, such as glycerol monostearate, fatty sugar esters, such as those disclosed WO 01/46361 (Unilever).

[0121] The compositions of the present invention may comprise a fatty complexing agent.

[0122] Especially suitable fatty complexing agents include fatty alcohols and fatty acids. Of these, fatty alcohols are most preferred.

Without being bound by theory it is believed that the fatty complexing material improves the viscosity profile of the composition by complexing with mono-ester component of the fabric conditioner material thereby providing a composition which has relatively higher levels of di-ester and tri-ester linked components. The di-ester and tri-ester linked components are more stable and do not affect initial viscosity as detrimentally as the mono-ester component.

[0123] It is also believed that the higher levels of mono-ester linked component present in compositions comprising

quaternary ammonium materials based on TEA may destabilise the composition through depletion flocculation. By using the fatty complexing material to complex with the mono-ester linked component, depletion flocculation is significantly reduced.

[0124] In other words, the fatty complexing agent at the increased levels, as required by the present invention, "neutralises" the mono-ester linked component of the quaternary ammonium material. This in situ di-ester generation from mono-ester and fatty alcohol also improves the softening of the composition.

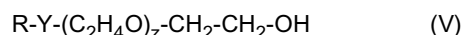
[0125] Preferred fatty acids include hardened tallow fatty acid (available under the trade name Pristerene™, ex Croda). Preferred fatty alcohols include hardened tallow alcohol (available under the trade names Stenol™ and Hydrenol™, ex BASF and Laurex™ CS, ex Huntsman).

[0126] The fatty complexing agent may be preferably present in an amount greater than 0.3 to 5% by weight based on the total weight of the composition. More preferably, the fatty component may be present in an amount of from 0.4 to 4%. The weight ratio of the mono-ester component of the quaternary ammonium fabric softening material to the fatty complexing agent is preferably from 5:1 to 1:5, more preferably 4:1 to 1:4, most preferably 3:1 to 1:3, e.g. 2:1 to 1:2.

Non-ionic surfactant

[0127] The compositions may further comprise a nonionic surfactant. Typically these can be included for the purpose of stabilising the compositions. Suitable nonionic surfactants include addition products of ethylene oxide with fatty alcohols, fatty acids and fatty amines. Any of the alkoxyated materials of the particular type described hereinafter can be used as the nonionic surfactant.

[0128] Suitable surfactants are substantially water soluble surfactants of the general formula (V):



where R is selected from the group consisting of primary, secondary and branched chain alkyl and/or acyl hydrocarbyl groups; primary, secondary and branched chain alkenyl hydrocarbyl groups; and primary, secondary and branched chain alkenyl-substituted phenolic hydrocarbyl groups; the hydrocarbyl groups having a chain length of from 8 to about 25, preferably 10 to 20, e.g. 14 to 18 carbon atoms.

[0129] In the general formula for the ethoxylated nonionic surfactant, Y is typically:

-O-, -C(O)O-, -C(O)N(R)- or -C(O)N(R)R-

in which R has the meaning given above for formula (V), or can be hydrogen; and Z is at least about 8, preferably at least about 10 or 11.

[0130] Preferably the nonionic surfactant has an HLB of from about 7 to about 20, more preferably from 10 to 18, e.g. 12 to 16. Genapol™ C200 (Clariant) based on coco chain and 20 EO groups is an example of a suitable nonionic surfactant.

[0131] If present, the nonionic surfactant is present in an amount from 0.01 to 10%, more preferably 0.1 to 5 by weight, based on the total weight of the composition.

[0132] A class of preferred non-ionic surfactants include addition products of ethylene oxide and/or propylene oxide with fatty alcohols, fatty acids and fatty amines. These are preferably selected from addition products of (a) an alkoxide selected from ethylene oxide, propylene oxide and mixtures thereof with (b) a fatty material selected from fatty alcohols, fatty acids and fatty amines.

[0133] Suitable surfactants are substantially water soluble surfactants of the general formula (VI):



where R is selected from the group consisting of primary, secondary and branched chain alkyl and/or acyl hydrocarbyl groups (when Y = -C(O)O-, R ≠ an acyl hydrocarbyl group); primary, secondary and branched chain alkenyl hydrocarbyl groups; and primary, secondary and branched chain alkenyl-substituted phenolic hydrocarbyl groups; the hydrocarbyl groups having a chain length of from 10 to 60, preferably 10 to 25, e.g. 14 to 20 carbon atoms.

[0134] In the general formula for the ethoxylated nonionic surfactant, Y is typically:

-O-, -C(O)O-, -C(O)N(R)- or -C(O)N(R)R-

in which R has the meaning given above for formula (VI), or can be hydrogen; and Z is at least about 6, preferably at least about 10 or 11.

[0135] Lutensol™ AT25 (BASF) based on coco chain and 25 EO groups is an example of a suitable non-ionic surfactant. Other suitable surfactants include Renex 36 (Trideceth-6), ex Croda; Tergitol 15-S3, ex Dow Chemical Co.; Dihydrol LT7, ex Thai Ethoxylate Ltd; Cremophor CO40, ex BASF and Neodol 91-8, ex Shell.

Further Optional Ingredients

[0136] The compositions may comprise other ingredients of fabric conditioner liquids as will be known to the person skilled in the art. Among such materials there may be mentioned: antifoams, perfumes and fragrances (both free oil and encapsulated material), insect repellents, shading or hueing dyes, preservatives (e.g. bactericides), pH buffering agents, perfume carriers, hydrotropes, anti-redeposition agents, soil-release agents, polyelectrolytes, anti-shrinking agents, anti-wrinkle agents, anti-oxidants, dyes, colorants, sunscreens, anti-corrosion agents, drape imparting agents, anti-static agents, sequestrants and ironing aids. The products of the invention may contain pearlisers and/or opacifiers. A preferred sequestrant is HEDP, an abbreviation for Etidronic acid or 1-hydroxyethane 1,1-diphosphonic acid.

Product Form

[0137] The products of the current invention comprise water.

[0138] The compositions are rinse-added softening compositions suitable for use in a laundry process. The compositions are pourable liquids.

[0139] The liquid compositions have a pH ranging from about 2.0 to 7, preferably from about 2.5 to 5.5, most preferably about 3.5 to 4.5. The compositions of the invention may also contain pH modifiers preferably hydrochloric acid, lactic acid of sodium hydroxide.

[0140] The composition is preferably a ready-to-use liquid comprising an aqueous phase. The aqueous phase may comprise water-soluble species, such as mineral salts or short chain (C₁₋₄) alcohols.

[0141] The composition is preferably for use in the rinse cycle of a home textile laundering operation, where, it may be added directly in an undiluted state to a washing machine, e.g. through a dispenser drawer or, for a top-loading washing machine, directly into the drum. The compositions may also be used in a domestic hand-washing laundry operation.

Process

[0142] The fabric conditioner of the current invention may be made by a process wherein, the plurality of anionic microcapsules encapsulating a benefit agent and cross linked, water swellable cationic co-polymer of at least one cationic monomer and optionally other non-ionic and/or anionic monomers are combined in the presence of cationic polysaccharide and non-ionic polysaccharide.

[0143] The order of addition of the may preferably be any of the following;

- Polysaccharides, cationic co-polymer, anionic microcapsule
- Cationic co-polymer, polysaccharides, anionic microcapsule
- Anionic microcapsule, polysaccharides, Cationic co-polymer

Examples

Example 1

[0144] A fabric conditioning composition according to the current invention;

	w.t. %
TEA Quat ¹	4
Free perfume *	1.17
Encapsulate Perfume ²	1.429 (slurry weight)
Cationic polysaccharide ³	0.2
Non-ionic poly saccharide ⁴	0.2
Cross linked, water swellable cationic co-polymer ⁵	0.1
Dyes *	0.005
Minors *	0.031

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(continued)

	w.t. %
Water *	To 100
<p>TEA Quat¹ - a partially hardened tallow TEA quat in Ethanol. ex. Solvay Encapsulate Perfume² - melamine formaldehyde perfume microcapsule, 1.429 w.t. % slurry provides 0.4 w.t. % microcapsules ex. IFF</p> <p>Cationic polysaccharide³ - a guar hydroxypropyltrimonium chloride having an average molecular weight of bellow 1,500,000 daltons</p> <p>Non-ionic poly saccharide⁴ - hydroxypropyl guar having an average Molecular Weight of between 1,500,000 and 2,500,000 daltons and a MS of between 0.9 and 1.6</p> <p>Cross linked, water swellable cationic co-polymer⁵ - Flosoft 270LS, ex. SNF</p> <p>Fabric conditioning compositions where made using the following orders of addition. The base composition (components marked with*) was the same as Example 1. The result was judged by a visual assessment of whether flocculation occurs following the addition of all the key components. Compositions A-E are comparative examples.</p>	

Composition	Order of addition of key components				Result
	1	2	3	4	
A	Encapsulated perfume ²	TEA Quat ¹			Dispersed
B	Cationic co-polymer ⁵	TEA Quat ¹			Dispersed
C	Cationic co-polymer ⁵	Encapsulated perfume ²	TEA Quat ¹		Flocculation
D	Encapsulated perfume ²	Cationic co-polymer ⁵	TEA Quat ¹		Flocculation
E	Cationic co-polymer ⁵	TEA Quat ¹	Encapsulated perfume ² pre-dispersed in water phase		Dispersed
1	Poly saccharides ⁶	Cationic co-polymer ⁵	Encapsulated perfume ²	TEA Quat ¹	Dispersed

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(continued)

Composition	Order of addition of key components				Result
	1	2	3	4	
2	Cationic co-polymer ⁵	Poly saccharides ⁶	Encapsulated perfume ²	TEA Quat ¹	Dispersed

Poly saccharides⁶ - the Cationic polysaccharide⁴ and Non-ionic poly saccharide⁵ where premixed prior to addition to other components.
 The compositions shown in table 1 were prepared using the following methods;
 Compositions A and B;
 1) The water was heated to about 50°C.
 2) Component 1 was then added to the heated water with stirring and the mixture was mixed thoroughly.
 3) The Minors were added.
 4) The Quat was then slowly added with stirring.
 5) The Dyes were then added and the mixture was mixed thoroughly.
 6) The composition was then cooled to about 35°C and the perfume component added with more mixing.
 7) The resultant composition was then cooled.
 Compositions C and D;
 1) The water was heated to about 50°C.
 2) Component 1 was then added to the heated water with stirring and the mixture was mixed thoroughly.
 3) The Minors were added.
 4) Component 2 was then added.
 5) The Quat was slowly added with stirring.
 6) The Dyes were then added and the mixture was mixed thoroughly.
 7) The composition was then cooled to about 35°C and the perfume component added with more mixing.
 8) The resultant composition was then cooled.
 Composition E;
 1) The water was heated to about 50°C.
 2) Component 1 was then added to the heated water with stirring and the mixture was mixed thoroughly.
 3) The Minors were added.
 4) Component 2 was then added.
 5) The Quat was slowly added with stirring.
 6) The Dyes were then added and the mixture was mixed thoroughly.
 7) The composition was then cooled to about 35°C and the perfume component added with more mixing.
 8) The resultant composition was then cooled
 Compositions 1 and 2;
 1) The water was heated to about 50°C.
 2) Component 1 was then added to the heated water with stirring and the mixture was mixed thoroughly.
 3) The Minors were added.
 4) Component 2 was then added.
 5) The encapsulated perfume was then added.
 6) The Quat was slowly added with stirring.
 7) The Dyes were then added and the mixture was mixed thoroughly.
 8) The composition was then cooled to about 35°C and the perfume component added with more mixing.
 9) The resultant composition was then cooled.

[0145] The polysaccharides were premixed before addition to the composition.

[0146] The encapsulated perfume compositions were added to the composition neat.

[0147] Comparative example E represents products currently on the market. This requires that the encapsulated perfume mix is pre-diluted in water prior to the addition to the main mix in order to avoid flocculation. Inventive compositions 1 and 2 demonstrated that this requirement is eliminated when a polysaccharide mix is also added to the composition.

Claims

1. A fabric conditioning composition comprising;

- a. 0.5 to 20 wt. % of a fabric softening active, which is a quaternary ammonium compound;
- b. 0.01 to 2 wt % Cationic polysaccharide;
- c. 0.01 to 2 wt % Non-ionic polysaccharide;
- d. A plurality of anionic microcapsules encapsulating a benefit agent;
- e. 0.001 to 0.5 wt % Cross linked, water swellable cationic co-polymer of at least one cationic monomer and optionally other non-ionic and/or anionic monomers; and
- f. Water.

2. A fabric conditioning composition according to claim 1, wherein the cationic polysaccharide is cationic guar.

3. A fabric conditioning composition according to claim 1 or 2, wherein the non-ionic polysaccharide is non-ionic guar.

4. A fabric conditioning composition according to any preceding claim, wherein the weight ratio of cationic polysaccharide in the composition to non-ionic polysaccharide in the composition is 1:10 to 10:1.

5. A fabric conditioning composition according to any preceding claim, wherein the combined weight of the cationic polysaccharide and non-ionic polysaccharide in the composition is 0.05 to 2 wt. % of the total composition.

6. A fabric conditioning composition according to any preceding claim, wherein the cationic polysaccharide and non-ionic polysaccharide are mixed prior to addition to the fabric conditioner composition.

7. A fabric conditioning composition according to any preceding claim, wherein the anionic microcapsules have an encapsulating wall comprising aminoplast polymers.

8. A fabric conditioning composition according to any preceding claim, wherein the benefit agent comprises perfume components.

9. A fabric conditioning composition according to any preceding claim, wherein the cross linked, water swellable cationic co-polymer comprises less than 20 % of water soluble polymeric chains, by total weight of the polymer, and a cross-linking agent concentration of from 500ppm to 5000ppm by weight relative to the polymer.

10. A fabric conditioning composition according to any preceding claim, wherein the cross linked, water swellable cationic co-polymer is formed by polymerisation of acrylamide and methacrylate.

11. A fabric conditioning composition according to any preceding claim, wherein the composition comprises at least two different cross linked water swellable cationic copolymers.

12. A fabric conditioning composition according to any preceding claim, wherein the quaternary ammonium compound is an ester linked quaternary ammonium compound.

13. A process for preparing a fabric conditioning composition according to any preceding claim, wherein the plurality of anionic microcapsules encapsulating a benefit agent and cross linked, water swellable cationic co-polymer of at least one cationic monomer and optionally other non-ionic and/or anionic monomers are combined in the presence of cationic polysaccharide and non-ionic polysaccharide.

Patentansprüche

1. Textilpflegezusammensetzung, umfassend:

- a. 0,5 bis 20 Gew.-% eines Textilweichmachers, welcher eine quaternäre Ammoniumverbindung ist;
- b. 0,01 bis 2 Gew.-% kationisches Polysaccharid;
- c. 0,01 bis 2 Gew.-% nicht-ionisches Polysaccharid;
- d. eine Vielzahl von anionischen Mikrokapseln, die ein Vorteilsmittel einkapseln;

- e. 0,001 bis 0,5 Gew.-% vernetztes, wasserquellbares kationisches Copolymer von mindestens einem kationischen Monomer und optional anderen nicht-ionischen und/oder anionischen Monomeren; und
- f. Wasser.

- 5 **2.** Textilpflegezusammensetzung nach Anspruch 1, wobei das kationische Polysaccharid kationisches Guar ist.
- 3.** Textilpflegezusammensetzung nach Anspruch 1 oder 2, wobei das nicht-ionische Polysaccharid ein nicht-ionisches Guar ist.
- 10 **4.** Textilpflegezusammensetzung nach irgendeinem vorhergehenden Anspruch, wobei das Gewichtsverhältnis von kationischem Polysaccharid in der Zusammensetzung zu nicht-ionischem Polysaccharid in der Zusammensetzung 1:10 bis 10:1 beträgt.
- 5.** Textilpflegezusammensetzung nach irgendeinem vorhergehenden Anspruch, wobei das kombinierte Gewicht des kationischen Polysaccharids und des nicht-ionischen Polysaccharids in der Zusammensetzung 0,05 bis 2 Gew.-% der gesamten Zusammensetzung beträgt.
- 15 **6.** Textilpflegezusammensetzung nach irgendeinem vorhergehenden Anspruch, wobei das kationische Polysaccharid und das nicht-ionische Polysaccharid vor der Zugabe zu der Textilpflegezusammensetzung gemischt werden.
- 20 **7.** Textilpflegezusammensetzung nach irgendeinem vorhergehenden Anspruch, wobei die anionischen Mikrokapseln eine einkapselnde Wand aufweisen, die Aminoplast-Polymere umfasst.
- 8.** Textilpflegezusammensetzung nach irgendeinem vorhergehenden Anspruch, wobei das Vorteilmittel Parfüm-Bestandteile umfasst.
- 25 **9.** Textilpflegezusammensetzung nach irgendeinem vorhergehenden Anspruch, wobei das vernetzte, wasserquellbare kationische Copolymer weniger als 20% wasserlösliche polymere Ketten, bezogen auf das Gesamtgewicht des Polymers, und eine Vernetzungsmittelkonzentration von 500 ppm bis 5000 ppm, bezogen auf das Gewicht des Polymers, umfasst.
- 30 **10.** Textilpflegezusammensetzung nach irgendeinem vorhergehenden Anspruch, wobei das vernetzte, wasserquellbare kationische Copolymer durch Polymerisation von Acrylamid und Methacrylat gebildet wird.
- 35 **11.** Textilpflegezusammensetzung nach irgendeinem vorhergehenden Anspruch, wobei die Zusammensetzung mindestens zwei verschiedene vernetzte, wasserquellbare kationische Copolymere umfasst.
- 12.** Textilpflegezusammensetzung nach irgendeinem vorhergehenden Anspruch, wobei die quaternäre Ammoniumverbindung eine Ester-verknüpfte quaternäre Ammoniumverbindung ist.
- 40 **13.** Verfahren zur Herstellung einer Textilpflegezusammensetzung nach irgendeinem vorhergehenden Anspruch, wobei die Vielzahl der anionischen Mikrokapseln, die ein Vorteilmittel einkapseln, und das vernetzte, wasserquellbare kationische Copolymer von mindestens einem kationischen Monomer und optional anderen nicht-ionischen und/oder anionischen Monomeren in Gegenwart von kationischem Polysaccharid und nicht-ionischem Polysaccharid kombiniert werden.
- 45

Revendications

- 50 **1.** Composition de conditionnement de textile comprenant ;
 - a. de 0,5 à 20 % en masse d'un actif d'assouplissant de textile, lequel est un composé d'ammonium quaternaire ;
 - b. de 0,01 à 2 % en masse de polysaccharide cationique ;
 - c. de 0,01 à 2 % en masse de polysaccharide non-ionique ;
 - 55 d. plusieurs microcapsules anioniques encapsulant un agent bénéfique ;
 - e. de 0,001 à 0,5 % en masse de co-polymère cationique gonflable dans l'eau, réticulé d'au moins un monomère cationique et éventuellement d'autres monomères non-ioniques et/ou anioniques ; et
 - f. de l'eau.

2. Composition de conditionnement de textile selon la revendication 1, dans laquelle le polysaccharide cationique est du guar cationique.
- 5 3. Composition de conditionnement de textile selon la revendication 1 ou 2, dans laquelle le polysaccharide non-ionique est du guar non-ionique.
- 10 4. Composition de conditionnement de textile selon l'une quelconque des revendications précédentes, dans laquelle le rapport massique de polysaccharide cationique dans la composition à polysaccharide non-ionique dans la composition est de 1:10 à 10:1.
- 15 5. Composition de conditionnement de textile selon l'une quelconque des revendications précédentes, dans laquelle la masse combinée des polysaccharide cationique et polysaccharide non-ionique dans la composition est de 0,05 à 2 % en masse de la composition totale.
- 20 6. Composition de conditionnement de textile selon l'une quelconque des revendications précédentes, dans laquelle les polysaccharide cationique et polysaccharide non-ionique sont mélangés avant l'addition à la composition de conditionnement de textile.
- 25 7. Composition de conditionnement de textile selon l'une quelconque des revendications précédentes, dans laquelle les microcapsules anioniques présentent une paroi d'encapsulation comprenant des polymères d'aminoplastes.
- 30 8. Composition de conditionnement de textile selon l'une quelconque des revendications précédentes, dans laquelle l'agent bénéfique comprend des constituants de parfums.
- 35 9. Composition de conditionnement de textile selon l'une quelconque des revendications précédentes, dans laquelle le co-polymère cationique gonflable dans l'eau, réticulé comprend moins de 20 % de chaînes polymères solubles dans l'eau, en masse totale du polymère, et une concentration en agent de réticulation de 500 ppm à 5 000 ppm en masse par rapport au polymère.
- 40 10. Composition de conditionnement de textile selon l'une quelconque des revendications précédentes, dans laquelle le co-polymère cationique gonflable dans l'eau, réticulé est formé par polymérisation d'acrylamide et de méthacrylate.
- 45 11. Composition de conditionnement de textile selon l'une quelconque des revendications précédentes, dans laquelle la composition comprend au moins deux copolymères cationiques gonflables dans l'eau réticulés différents.
- 50 12. Composition de conditionnement de textile selon l'une quelconque des revendications précédentes, dans laquelle le composé d'ammonium quaternaire est un composé d'ammonium quaternaire lié à un ester.
- 55 13. Procédé de préparation d'une composition de conditionnement de textile selon l'une quelconque des revendications précédentes, dans lequel les plusieurs microcapsules anioniques encapsulant un agent bénéfique et un co-polymère cationique gonflable dans l'eau, réticulé d'au moins un monomère cationique et éventuellement d'autres monomères non-ioniques et/ou anioniques sont combinés en présence de polysaccharide cationique et polysaccharide non-ionique.

REFERENCES CITED IN THE DESCRIPTION

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