



(11) **EP 2 561 057 B1**

(12) **EUROPEAN PATENT SPECIFICATION**

(45) Date of publication and mention of the grant of the patent:  
**06.05.2015 Bulletin 2015/19**

(51) Int Cl.:  
**C11D 3/22** <sup>(2006.01)</sup> **C11D 3/00** <sup>(2006.01)</sup>  
**C11D 1/62** <sup>(2006.01)</sup>

(21) Application number: **11706613.4**

(86) International application number:  
**PCT/EP2011/053364**

(22) Date of filing: **07.03.2011**

(87) International publication number:  
**WO 2011/131412 (27.10.2011 Gazette 2011/43)**

(54) **IMPROVEMENTS RELATING TO FABRIC CONDITIONERS**

VERBESSERUNGEN IM ZUSAMMENHANG MIT WÄSCHEWEICHMACHERN  
AMÉLIORATIONS ASSOCIÉES AUX ADOUCISSANTS TEXTILES

(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: **22.04.2010 EP 10160725**

(43) Date of publication of application:  
**27.02.2013 Bulletin 2013/09**

(73) Proprietors:  
• **Unilever PLC**  
**London EC4Y 0DY (GB)**  
Designated Contracting States:  
**CY GB IE MT**  
• **Unilever N.V.**  
**3013 AL Rotterdam (NL)**  
Designated Contracting States:  
**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**

(72) Inventors:  
• **BIRD, Nigel, Peter**  
**Merseyside CH63 3JW (GB)**  
• **BURGESS, Karl**  
**Merseyside CH63 3JW (GB)**  
• **TAYLOR, Neil, Fletcher**  
**Merseyside CH63 3JW (GB)**

(74) Representative: **Bristow, Stephen Robert et al**  
**Unilever Patent Group**  
**Colworth House**  
**Sharnbrook**  
**Bedford, MK44 1LQ (GB)**

(56) References cited:  
**EP-A1- 0 044 003 US-A1- 2006 223 739**

**EP 2 561 057 B1**

Note: Within nine months of the publication of the mention of the grant of the European patent in the European Patent Bulletin, any person may give notice to the European Patent Office of opposition to that patent, in accordance with the Implementing Regulations. Notice of opposition shall not be deemed to have been filed until the opposition fee has been paid. (Art. 99(1) European Patent Convention).

**Description****Technical Field**

5 [0001] The present invention relates to the use of partially cationically substituted quaternary ammonium polymers, in laundry processes, for dye fixing benefits in textiles.

**Background and Prior Art**

10 [0002] Many fabrics lose some dye into the water during the wash process. The problem is particularly prevalent with direct dyed fabrics (where the dye has been added to the fabric in a soluble form to enable absorption into the fibres). Dye fixers are widely used as a treatment in the textile industry, and are known in consumer laundry products. However, whilst these commercial materials can provide a substantial reduction in dye loss, the structural requirements for effectiveness result in an unacceptable environmental profile. Specifically, effective commercial dye fixers are relatively low  
15 molecular weight polymers with a high degree of cationic charge. Dye fixing properties are known to become ineffective with decrease in cationic charge.

[0003] WO04056888 (Ciba) discloses polymeric dye fixers for laundry applications formed from cationic and hydrophobic unsaturated monomers.

20 [0004] WO9746650, WO9746651, WO9746652 and WO9746654 (all Procter and Gamble) disclose fabric softeners with dye fixer(s). A wide range of commercial dye fixers and types of molecule with fixing properties is disclosed. Polymeric ammonium compounds are specified, which have a high level of quaternised or protonated amine groups. Such polymers are not suitable for application as dye fixers in fabric conditioners due to their poor ecotox properties.

[0005] WO9927049 (Procter and Gamble) describes a fabric softening composition with a cellulose reactive dye fixing agent, for improved performance.

25 [0006] Dye fixers in rinse products are also known from WO9812295 and WO9812296 (Procter and Gamble), which disclose specific amino-functional polymers with a dye fixer.

[0007] WO9820098 and WO9820099 (Procter and Gamble) disclose specific amino-functional polymers in conjunction with a chlorine scavenger and a dye fixer.

[0008] WO200131116 (Procter and Gamble) discloses a fabric enhancer formulation comprising a dye fixer and solvent.

30 [0009] DE19643281 covers use of specified polycationic quaternised products as dye fixers in detergents or rinses.

[0010] US2006/0223739 (Unilever) discloses an aqueous fabric softening composition suitable for use in a wash and/or rinse cycle of an automatic laundry machine, comprising: (a) 0.05 to 2 wt% of a cationic quaternary cellulose ether polymer; (b) a fatty acid soap, wherein the weight ratio the soap to the polymer is at least 2:1; and (c) from 0.1 to 5 % of an amphoteric surfactant. In addition to softening, these cationic polymer/anionic surfactant compositions are  
35 said to lubricate the fibres of textile articles, thus resulting in reduced wear, pilling and color fading, and the provision of a shape-retention benefit. It is further postulated that the lubricating layer may also provide a substrate on the fabric for retaining fragrances and other benefit agents.

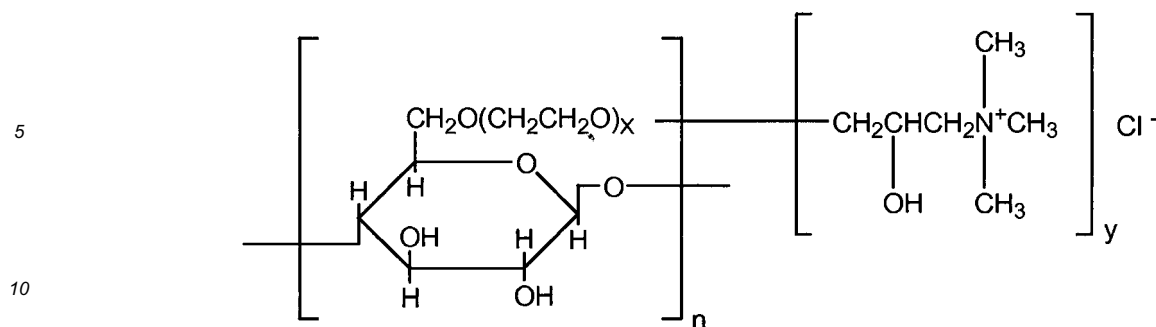
[0011] Some partially cationically substituted quaternary ammonium polymers are already approved for use in laundry products for a variety of benefits, for example as deposition aids. We have now found that some of these materials have  
40 previously unrecognised dye fixing properties when delivered in the rinse. These materials have a lower level of cationic charge than conventional dye fixers, due to the presence of fewer quaternised groups per monomer unit which not only obviates the adverse ecotox properties but surprisingly also provides a significant dye fixing benefit, despite the lower cationic charge.

[0012] Specifically, we have now found that when delivered from a fabric conditioner, these materials, namely partially  
45 cationically substituted quaternary ammonium salts, can improve dye fixing in the next wash. Over many washes, the consumer is able to see reduced dye fading on the articles concerned. When delivered from a fabric conditioner, the main benefit is apparent in the next wash, as there is generally minimal dye loss in the final rinse. The benefit is particularly discernable for direct dyes on cotton fabrics.

**Statement of the Invention**

50 [0013] In a first aspect of the invention there is provided a use of a cationic polymer in the treatment of textiles to improve dye fixation in textiles, wherein the cationic polymer is a linear cationically substituted quaternary ammonium salt according to the following Formula (I):

55



wherein, x is from 0 to 3 and the ratio of y:n is in the range of from 0.01 - 0.5 (i.e. n:y is from 100 to 2), provided that y  $\neq$  n, wherein the cationic polymer is comprised in a textile treatment composition at a level of from 0.001% to 1% by weight of the total composition, characterised in that the textile treatment composition comprises a fabric softening active, selected from an oily sugar derivative, a cationic fabric softening compounds and mixtures thereof, and wherein the treatment comprising rinsing a fabric in the textile treatment composition to deposit fabric conditioner and polymer thereon such that a dye fixing benefit is apparent in subsequent washes.

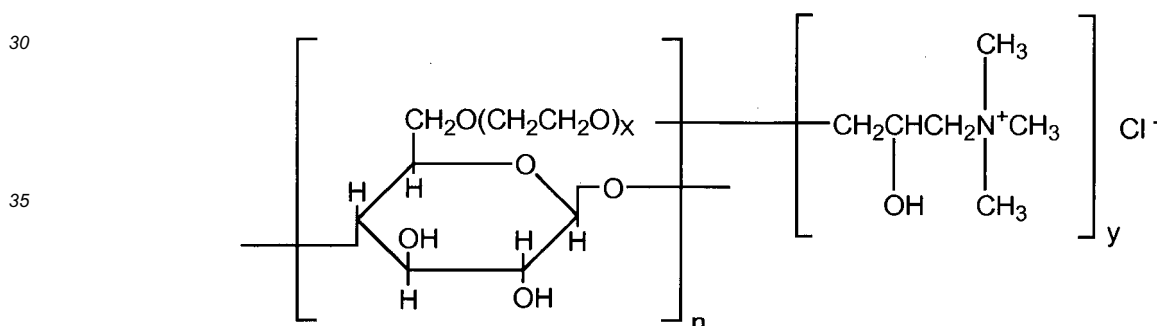
## 20 Detailed Description of the Invention

### The cationic polymer

[0014] The cationic polymers for use in this invention are partially cationically substituted quaternary ammonium salts.

25 [0015] The polymers conform to the structure given by Formula (I) below:

Formula (I):



[0016] Wherein, x is from 0 to 3, preferably from 0 to 1; and the ratio of y:n is in the range of from 0.01 to 0.5 (i.e. n:y = from 100 to 2). It is a feature of the present invention that polymers with fully quaternised sugar units, i.e. y = n; are excluded.

[0017] The ratio of unquaternised to quaternised sugar units (n:y) is preferably in the range of from 3 to 30, more preferably from 4 to 25, most preferably from 5 to 20.

[0018] The level of nitrogen in the polymer is in the range of from 0.1 to 1.5%, more preferably, from 0.3 to 1.3%, most preferably from 0.5 to 1.1% by weight.

[0019] The molecular weight of the polymer is in the range of from 1,000 to 1,000,000 kDa, preferably from 5,000 to 750,000 kDa, more preferably from 10,000 to 500,000 kDa.

[0020] Mixtures of polymers may be used.

[0021] The polymers are linear in structure.

[0022] Examples of suitable materials include cationic derivatives of natural polymers, such as cationically-modified polysaccharides such as Polyquaternium-10. Preferred examples are Polyquaternium 10, UCARE Polymer JR-400, UCARE Polymer LR-400, all ex Dow, and their copolymers. The most preferred polymer is UCARE Polymer LR-400.

55 [0023] The amount of polymer in the textile treatment composition is in the range of from 0.001 % to 1% preferably from 0.005% to 0.5 %, more preferably from 0.01 % to 0.25 % and most preferably from 0.02 to 0.1 % by weight of the total composition.

[0024] The polymer is added to the rinse water, preferably the final rinse of a wash process.

**[0025]** The use of the cationic polymer in the treatment of textiles to improve dye fixation in textiles, comprises rinsing a fabric in the presence of the polymer and a textile treatment composition comprising fabric softening active to deposit fabric softening active and polymer thereon such that a dye fixing benefit is apparent in subsequent washes.

**[0026]** The use comprises rinsing a fabric in a fabric treatment composition to deposit polymer thereon such that a dye fixing benefit is apparent in subsequent washes. The fabric treatment composition comprises a fabric softening active.

### **Further ingredients**

**[0027]** The polymer is comprised in a textile treatment composition. Further suitable ingredients include the following:-

### **Fabric conditioning agents**

**[0028]** The textile treatment composition contains a fabric conditioning agent (also referred to herein as fabric softening active) which may be cationic or non-ionic. The fabric softening active is selected from an oily sugar derivative, a cationic fabric softening compound and mixtures thereof.

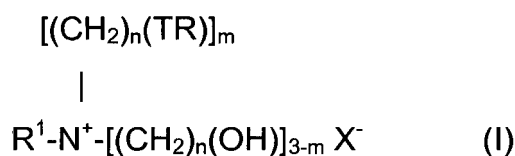
**[0029]** Fabric conditioning compositions which may comprise the cationic polymer in accordance with the invention may be dilute or concentrated. Dilute products typically contain up to about 8 %, generally about 2 to 8 % by weight of softening active, whereas concentrated products may contain up to about 50 wt %, preferably from about 8 to about 50 %, more preferably from 8 to 25 % by weight active. Compositions of more than about 25 % by weight of active are defined as "super concentrated", depending on the active system, and are also intended to be covered by the present invention. The fabric conditioning agent may, for example, be used in amounts of from 0.5 % to 35 %, preferably from 2 % to 30 % more preferably from 5 % to 25 % and most preferably from 8 % to 20 % by weight of the composition.

**[0030]** The preferred softening active for use in rinse conditioner compositions in accordance with the invention is a quaternary ammonium compound (QAC). The preferred quaternary ammonium fabric conditioner for use in compositions of the present invention are the so called "ester quats".

**[0031]** Particularly preferred materials are the ester-linked triethanolamine (TEA) quaternary ammonium compounds comprising a mixture of mono-, di- and tri-ester linked components.

**[0032]** Typically, TEA-based fabric softening compounds 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 wt % of the fabric softening compound and at least 10 % of the monoester linked component. A preferred hardened type of active has a typical mono:di:tri ester distribution in the range of from 12 to 25 mono: from 55 to 65 di: from 15 to 27 tri. A soft TEA quat may have a typical mono:di:tri ester distribution of from 25 to 45 %, preferably from 30 to 40 % mono: from 45 to 60 %, preferably from 50 to 55 % di: and from 5 to 25 %, preferably from 10 to 15 % tri; for example 40:60:10.

**[0033]** 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 C<sub>5-35</sub> alkyl or alkenyl group; R<sup>1</sup> represents a C<sub>1-4</sub> alkyl, C<sub>2-4</sub> alkenyl or a C<sub>1-4</sub> 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<sup>-</sup> is an anionic counterion, 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.

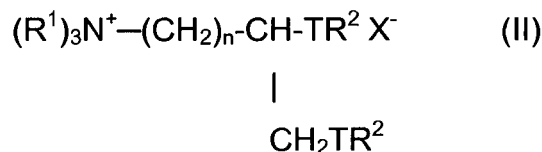
**[0034]** Especially preferred agents are preparations which are rich in the di-esters of triethanolammonium methylsulphate, otherwise referred to as "TEA ester quats".

**[0035]** Commercial examples include Stepantex™ UL85, ex Stepan, Prapagen™ TQL, ex Clariant, and Tetranyl™ AHT-1, ex Kao, (all 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 C<sub>10</sub>-C<sub>20</sub> and C<sub>16</sub>-C<sub>18</sub> unsaturated fatty acids), ex Witco Corporation.

**[0036]** Also, soft quaternary ammonium actives such as Stepantex VK90, Stepantex VT90, SP88 (ex-Stepan), Pra-

pagen 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) are suitable.

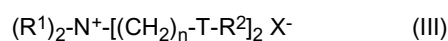
[0037] A second group of QACs suitable for use in the invention is represented by formula (II):



wherein each R<sup>1</sup> group is independently selected from C<sub>1-4</sub> alkyl, hydroxyalkyl or C<sub>2-4</sub> alkenyl groups; and wherein each R<sup>2</sup> group is independently selected from C<sub>8-28</sub> alkyl or alkenyl groups; and wherein n, T, and X<sup>-</sup> are as defined above.

[0038] 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.

[0039] A third group of QACs suitable for use in the invention is represented by formula (III):



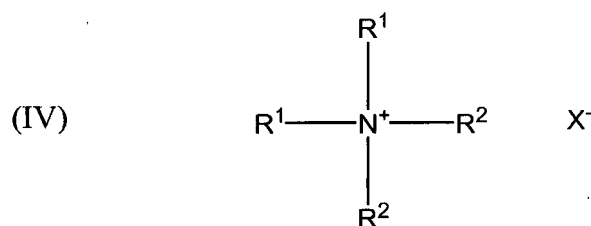
wherein each R<sup>1</sup> group is independently selected from C<sub>1-4</sub> alkyl, or C<sub>2-4</sub> alkenyl groups; and wherein each R<sup>2</sup> group is independently selected from C<sub>8-28</sub> alkyl or alkenyl groups; and n, T, and X<sup>-</sup> are as defined above. Preferred materials of this third group include bis(2-tallowoyloxyethyl)dimethyl ammonium chloride, partially hardened and hardened versions thereof.

[0040] 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.

[0041] 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 compound comprise unsaturated fatty chains.

[0042] Iodine value as used in the context of the present invention refers to 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.

[0043] A further type of softening compound is a non-ester quaternary ammonium material represented by formula (IV) below:-



wherein each R<sup>1</sup> group is independently selected from C<sub>1-4</sub>alkyl, hydroxyalkyl or C<sub>2-4</sub> alkenyl groups; R<sup>2</sup> group is independently selected from C<sub>8-28</sub> alkyl or alkenyl groups, and X<sup>-</sup> is as defined above.

#### Oily sugar derivatives

[0044] The compositions for use in the invention may 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 C<sub>8</sub>-C<sub>22</sub> alkyl or alkenyl chain.

[0045] 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.

**[0046]** 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.

**[0047]** 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 C<sub>8</sub> to C<sub>22</sub> alkyl or alkenyl chain. The C<sub>8</sub> to C<sub>22</sub> alkyl or alkenyl groups may be branched or linear carbon chains.

**[0048]** 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.

**[0049]** Preferably the CPE or RSE contains at least 35 % tri or higher esters, e.g. at least 40%.

**[0050]** 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.

**[0051]** These chains are referred to below as the ester or ether chains (of the CPE or RSE).

**[0052]** The ester or ether chains of the CPE or RSE are preferably predominantly unsaturated. Preferred CPEs or RSEs include sucrose tetraoleate, sucrose tetraoleate, sucrose tetraoleate, sucrose tetraesters of soybean oil or cotton seed oil, cellobiose tetraoleate, sucrose trioleate, sucrose trioleate, sucrose pentaoleate, sucrose pentarapeate, sucrose hexaoleate, sucrose hexarapeate, sucrose triesters, pentaesters and hexaesters of soybean oil or cotton seed oil, glucose trioleate, 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.

**[0053]** The most highly preferred liquid CPEs or RSEs are any of the above but where the polyunsaturation has been removed through partial hydrogenation.

**[0054]** 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.

**[0055]** CPEs are preferred for use with the present invention. Inositol is a preferred example of a cyclic polyol. Inositol derivatives are especially preferred.

**[0056]** 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.

**[0057]** 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.

**[0058]** 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).

**[0059]** 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.

**[0060]** 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 C<sub>1</sub> position. Suitable examples of such compounds include methyl glucose derivatives.

**[0061]** Examples of suitable CPEs include esters of alkyl(poly)glucosides, in particular alkyl glucoside esters having a degree of polymerisation of 2.

**[0062]** The length of the unsaturated (and saturated if present) chains in the CPE or RSE is C<sub>8</sub>-C<sub>22</sub>, preferably C<sub>12</sub>-C<sub>22</sub>. It is possible to include one or more chains of C<sub>1</sub>-C<sub>8</sub>, however these are less preferred.

**[0063]** 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 T<sub>2</sub> 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 T<sub>2</sub> 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 T<sub>2</sub> of less than 100 μs is considered to be

a solid component and any component with  $T_2 \geq 100 \mu\text{s}$  is considered to be a liquid component.

**[0064]** 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.

**[0065]** The HLB of the CPE or RSE is typically between 1 and 3.

**[0066]** 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%.

**[0067]** The CPEs and RSEs for use in the compositions of the invention include sucrose tetraoleate, sucrose pentaerucate, sucrose tetraerucate and sucrose pentaoleate.

### Co-softeners and fatty complexing agents

**[0068]** Co-softeners may be used. When employed, they are typically present at from 0.1 to 20% and particularly at from 0.5 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).

**[0069]** The compositions for use in the present invention may comprise a fatty complexing agent.

**[0070]** Especially suitable fatty complexing agents include fatty alcohols, which are most preferred.

**[0071]** Fatty complexing material may be used to improve the viscosity profile of the composition.

**[0072]** Preferred fatty acids include hardened tallow fatty acid (available under the tradename Pristerene™, ex Uniqema). Preferred fatty alcohols include hardened tallow alcohol (available under the tradenames Stenol™ and Hydrenol™, ex Cognis and Laurex™ CS, ex Albright and Wilson).

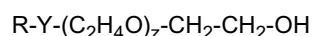
**[0073]** The fatty complexing agent is preferably present in an amount of from 0.2 to 5% by weight based on the total weight of the composition. More preferably, the fatty component is present in an amount of from 0.4 to 4%. The weight ratio of the mono-ester component of the quaternary ammonium fabric 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

**[0074]** The compositions for use in the present invention may further comprise a nonionic surfactant. Typically these can be included for the purpose of stabilising the compositions. These are particularly suitable for compositions comprising hardened quaternary ammonium compounds.

**[0075]** Suitable nonionic surfactants include addition products of ethylene oxide and/or propylene 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.

**[0076]** Suitable surfactants are substantially water soluble surfactants of the general formula:



where R is selected from the group consisting of primary, secondary and branched chain alkyl and/or acyl hydrocarbyl groups (when  $\text{Y} = \text{-C(O)O}$ ,  $\text{R} \neq$  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 8 to about 25, preferably 10 to 20, e.g. 14 to 18 carbon atoms.

**[0077]** In the general formula for the ethoxylated nonionic surfactant, Y is typically:



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

**[0078]** 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.

**[0079]** 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.

### Shading Dyes

**[0080]** Optional shading dyes can be used. Preferred dyes are violet or blue. Suitable and preferred classes of dyes are discussed below. Moreover the unsaturated quaternary ammonium compounds are subject to some degree of UV light and/or transition metal ion catalysed radical auto-oxidation, with an attendant risk of yellowing of fabric. The presence

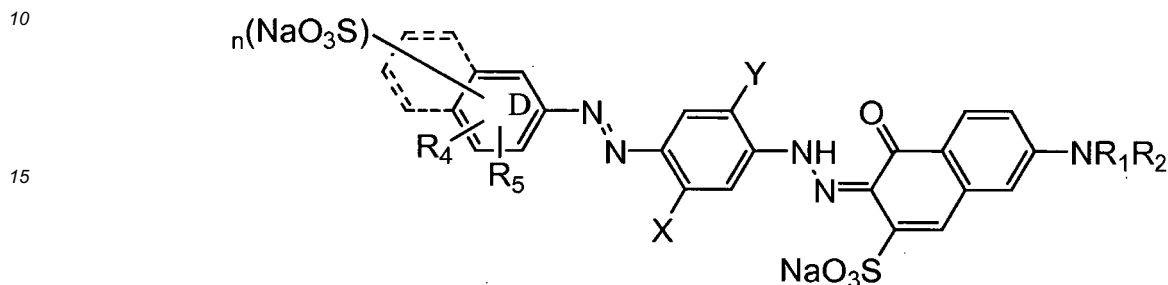
of a shading dye also reduces the risk of yellowing from this source.

### Direct Dyes

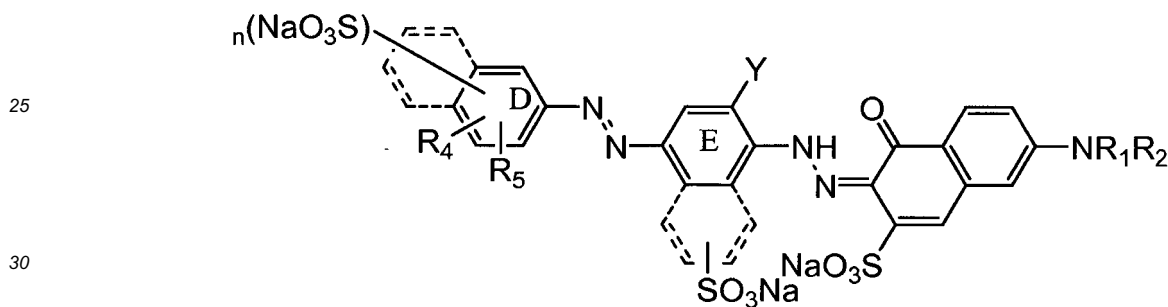
5 **[0081]** Direct dyes (otherwise known as substantive dyes) are the class of water soluble dyes which have an affinity for fibres and are taken up directly. Direct violet and direct blue dyes are preferred.

**[0082]** Preferably the dye are *bis*-azo or *tris*-azo dyes are used.

**[0083]** Most preferably, the direct dye is a direct violet of the following structures:



20 or



wherein:

35 ring D and E may be independently naphthyl or phenyl as shown;

$R_1$  is selected from: hydrogen and C1-C4-alkyl, preferably hydrogen;

$R_2$  is selected from: hydrogen, C1-C4-alkyl, substituted or unsubstituted phenyl and substituted or unsubstituted naphthyl, preferably phenyl;

$R_3$  and  $R_4$  are independently selected from: hydrogen and C1-C4-alkyl, preferably hydrogen or methyl;

40 X and Y are independently selected from: hydrogen, C1-C4-alkyl and C1-C4-alkoxy; preferably the dye has X= methyl; and, Y = methoxy and n is 0, 1 or 2, preferably 1 or 2.

**[0084]** Preferred dyes are direct violet 7, direct violet 9, direct violet 11, direct violet 26, direct violet 31, direct violet 35, direct violet 40, direct violet 41, direct violet 51, and direct violet 99. Bis-azo copper containing dyes such as direct violet 66 may be used.

**[0085]** The benzidine based dyes are less preferred.

**[0086]** Preferably the direct dye is present at Q00001 wt% to 0.0010 wt% of the formulation.

**[0087]** In another embodiment the direct dye may be covalently linked to the photo-bleach, for example as described in WO2006/024612.

50

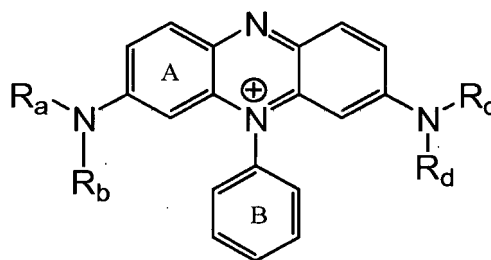
### Acid dyes

**[0088]** Cotton substantive acid dyes give benefits to cotton containing garments. Preferred dyes and mixes of dyes are blue or violet. Preferred acid dyes are:

55

(i) azine dyes, wherein the dye is of the following core structure:





wherein  $R_a$ ,  $R_b$ ,  $R_c$  and  $R_d$  are selected from: H, a branched or linear C1 to C7-alkyl chain, benzyl a phenyl, and a naphthyl;  
 the dye is substituted with at least one  $\text{SO}_3^-$  or  $-\text{COO}^-$  group;  
 the B ring does not carry a negatively charged group or salt thereof;  
 and the A ring may further substituted to form a naphthyl;  
 the dye is optionally substituted by groups selected from: amine, methyl, ethyl, hydroxyl, methoxy, ethoxy, phenoxy, Cl, Br, I, F, and  $\text{NO}_2$ .

**[0089]** Preferred azine dyes are: acid blue 98, acid violet 50, and acid blue 59, more preferably acid violet 50 and acid blue 98.

**[0090]** Other preferred non-azine acid dyes are acid violet 17, acid black 1 and acid blue 29.

**[0091]** Preferably the acid dye is present at 0.0005 wt% to 0.01 wt% of the formulation.

#### Hydrophobic dyes

**[0092]** The composition for use in the invention may comprise one or more hydrophobic dyes selected from benzodifuranes, methine, triphenylmethanes, naphthalimides, pyrazole, naphthoquinone, anthraquinone and mono-azo or di-azo dye chromophores. Hydrophobic dyes are dyes which do not contain any charged water solubilising group. Hydrophobic dyes may be selected from the groups of disperse and solvent dyes. Blue and violet anthraquinone and mono-azo dye are preferred.

**[0093]** Preferred dyes include solvent violet 13, disperse violet 27 disperse violet 26, disperse violet 28, disperse violet 63 and disperse violet 77.

**[0094]** Preferably the hydrophobic dye is present at 0.0001 wt% to 0.005 wt% of the formulation.

#### Basic dyes

**[0095]** Basic dyes are organic dyes which carry a net positive charge. They deposit onto cotton. They are of particular utility for used in composition that contain predominantly cationic surfactants. Dyes may be selected from the basic violet and basic blue dyes listed in the Colour Index International.

**[0096]** Preferred examples include triarylmethane basic dyes, methane basic dye, anthraquinone basic dyes, basic blue 16, basic blue 65, basic blue 66, basic blue 67, basic blue 71, basic blue 159, basic violet 19, basic violet 35, basic violet 38, basic violet 48; basic blue 3, basic blue 75, basic blue 95, basic blue 122, basic blue 124, basic blue 141.

#### Reactive dyes

**[0097]** Reactive dyes are dyes which contain an organic group capable of reacting with cellulose and linking the dye to cellulose with a covalent bond. They deposit onto cotton.

**[0098]** Preferably the reactive group is hydrolysed or reactive group of the dyes has been reacted with an organic species such as a polymer, so as to the link the dye to this species. Dyes may be selected from the reactive violet and reactive blue dyes listed in the Colour Index International.

**[0099]** Preferred examples include reactive blue 19, reactive blue 163, reactive blue 182 and reactive blue 96.

#### Dye conjugates

**[0100]** Dye conjugates are formed by binding direct, acid or basic dyes to polymers or particles via physical forces.

**[0101]** Dependent on the choice of polymer or particle they deposit on cotton or synthetics. A description is given in WO2006/055787. They are not preferred.

**[0102]** Particularly preferred dyes are: direct violet 7, direct violet 9, direct violet 11, direct violet 26, direct violet 31,

direct violet 35, direct violet 40, direct violet 41, direct violet 51, direct violet 99, acid blue 98, acid violet 50, acid blue 59, acid violet 17, acid black 1, acid blue 29, solvent violet 13, disperse violet 27 disperse violet 26, disperse violet 28, disperse violet 63, disperse violet 77 and mixtures thereof.

## 5 Perfume

**[0103]** The compositions for use in the present invention may comprise one or more perfumes if desired. The perfume is preferably present in an amount 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 composition.

10 **[0104]** Useful components of the perfume include materials of both natural and synthetic origin. They include single compounds and mixtures. Specific examples of such components may be found in the current literature, e.g., in Fenaroli's Handbook of Flavor Ingredients, 1975, CRC Press; Synthetic Food Adjuncts, 1947 by M. B. Jacobs, edited by Van Nostrand; or Perfume and Flavor Chemicals by S. Arctander 1969, Montclair, N.J. (USA). These substances are well known to the person skilled in the art of perfuming, flavouring, and/or aromatizing consumer products, i.e., of imparting an odour and/or a flavour or taste to a consumer product traditionally perfumed or flavoured, or of modifying the odour and/or taste of said consumer product.

15 **[0105]** By perfume in this context is not only meant a fully formulated product fragrance, but also selected components of that fragrance, particularly those which are prone to loss, such as the so-called 'top notes'.

20 **[0106]** Top notes are defined by Poucher (Journal of the Society of Cosmetic Chemists 6(2):80 [1955]). Examples of well known top-notes include citrus oils, linalool, linalyl acetate, lavender, dihydromyrcenol, rose oxide and cis-3-hexanol. Top notes typically comprise 15-25%wt of a perfume composition.

25 **[0107]** Some or all of the perfume or pro-fragrance may be encapsulated. Typical perfume components which it is advantageous to encapsulate include those with a relatively low boiling point, preferably those with a boiling point of less than 300°C, preferably 100-250°C and pro-fragrances which can produce such components. In those embodiments of the invention which contain an increased level of top-notes it is envisaged that at least 20%wt would be present within the encapsulate.

30 **[0108]** It is also advantageous to encapsulate perfume components which have a low Clog P (i.e. those which will be partitioned into water), preferably with a Clog P of less than 3.0. These materials, of relatively low boiling point and relatively low Clog P have been called the "delayed blooming" perfume ingredients and include the following materials:

35 Allyl Caproate, Amyl Acetate, Amyl Propionate, Anisic Aldehyde, Anisole, Benzaldehyde, Benzyl Acetate, Benzyl Acetone, Benzyl Alcohol, Benzyl Formate, Benzyl Iso Valerate, Benzyl Propionate, Beta Gamma Hexenol, Camphor Gum, Laevo-Carvone, d-Carvone, Cinnamic Alcohol, Cinamyl Formate, Cis-Jasmone, cis-3-Hexenyl Acetate, Cumenic Alcohol, Cyclal C, Dimethyl Benzyl Carbinol, Dimethyl Benzyl Carbinol Acetate, Ethyl Acetate, Ethyl Aceto Acetate, Ethyl Amyl Ketone, Ethyl Benzoate, Ethyl Butyrate, Ethyl Hexyl Ketone, Ethyl Phenyl Acetate, Eucalyptol, Eugenol, Fenchyl Acetate, Flor Acetate (tricyclo Decenyl Acetate), Frutene (tricyclo Decenyl Propionate), Geraniol, Hexenol, Hexenyl Acetate, Hexyl Acetate, Hexyl Formate, Hydratropic Alcohol, Hydroxycitronellal, Indone, Isoamyl Alcohol, Iso Menthone, Isopulegyl Acetate, Isoquinolone, Ligustral, Linalool, Linalool Oxide, Linalyl Formate, Menthone, Menthyl Acetphenone, Methyl Amyl Ketone, Methyl Anthranilate, Methyl Benzoate, Methyl Benyl Acetate, Methyl Eugenol, Methyl Heptenone, Methyl Heptene Carbonate, Methyl Heptyl Ketone, Methyl Hexyl Ketone, Methyl Phenyl Carbonyl Acetate, Methyl Salicylate, Methyl-N-Methyl Anthranilate, Nerol, Octalactone, Octyl Alcohol, p-Cresol, p-Cresol Methyl Ether, p-Methoxy Acetophenone, p-Methyl Acetophenone, Phenoxy Ethanol, Phenyl Acetaldehyde, Phenyl Ethyl Acetate, Phenyl Ethyl Alcohol, Phenyl Ethyl Dimethyl Carbinol, Prenyl Acetate, Propyl Bornate, Pulegone, Rose Oxide, Safrole, 4-Terpinenol, Alpha-Terpinenol, and/or Viridine

45 **[0109]** Preferred non-encapsulated perfume ingredients are those hydrophobic perfume components with a ClogP above 3. As used herein, the term "ClogP" means the logarithm to base 10 of the octanol/water partition coefficient (P). The octanol/water partition coefficient of a perfume raw material (PRM) is the ratio between its equilibrium concentrations in octanol and water. Given that this measure is a ratio of the equilibrium concentration of a PRM in a non-polar solvent (octanol) with its concentration in a polar solvent (water), ClogP is also a measure of the hydrophobicity of a material--the higher the ClogP value, the more hydrophobic the material. ClogP values can be readily calculated from a program called "CLOGP" which is available from Daylight Chemical Information Systems Inc., Irvine Calif., USA. Octanol/water partition coefficients are described in more detail in U.S. Pat. No. 5,578,563.

50 **[0110]** Perfume components with a ClogP above 3 comprise: Iso E super, citronellol, Ethyl cinnamate, Bangalol, 2,4,6-Trimethylbenzaldehyde, Hexyl cinnamic aldehyde, 2,6-Dimethyl-2-heptanol, Diisobutylcarbinol, Ethyl salicylate, Phenethyl isobutyrate, Ethyl hexyl ketone, Propyl amyl ketone, Dibutyl ketone, Heptyl methyl ketone, 4,5-Dihydrotoluene, Caprylic aldehyde, Citral, Geraniol, Isopropyl benzoate, Cyclohexanepropionic acid, Campholene aldehyde, Caprylic acid, Caprylic alcohol, Cuminaldehyde, 1-Ethyl-4-nitrobenzene, Heptyl formate, 4-Isopropylphenol, 2-Isopropylphenol,

3-Isopropylphenol, Allyl disulfide, 4-Methyl-1-phenyl-2-pentanone, 2-Propylfuran, Allyl caproate, Styrene, Isoeugenyl methyl ether, Indonaphthene, Diethyl suberate, L-Menthone, Menthone racemic, p-Cresyl isobutyrate, Butyl butyrate, Ethyl hexanoate, Propyl valerate, n-Pentyl propanoate, Hexyl acetate, Methyl heptanoate, trans-3,3,5-Trimethylcyclohexanol, 3,3,5-Trimethylcyclohexanol, Ethyl p-anisate, 2-Ethyl-1-hexanol, Benzyl isobutyrate, 2,5-Dimethylthiophene, Iso-butyl 2-butenate, Caprylnitrile, gamma-Nonalactone, Nerol, trans-Geraniol, 1-Vinylheptanol, Eucalyptol, 4-Terpinenol, Dihydrocarveol, Ethyl 2-methoxybenzoate, Ethyl cyclohexanecarboxylate, 2-Ethylhexanal, Ethyl amyl carbinol, 2-Octanol, 2-Octanol, Ethyl methylphenylglycidate, Diisobutyl ketone, Coumarone, Propyl isovalerate, Isobutyl butanoate, Iso-pentyl propanoate, 2-Ethylbutyl acetate, 6-Methyl-tetrahydroquinoline, Eugenyl methyl ether, Ethyl dihydrocinnamate, 3,5-Dimethoxytoluene, Toluene, Ethyl benzoate, n-Butyrophenone, alpha-Terpineol, Methyl 2-methylbenzoate, Methyl 4-methylbenzoate, Methyl 3-methylbenzoate, sec. Butyl n-butyrate, 1,4-Cineole, Fenchyl alcohol, Pinanol, cis-2-Pinanol, 2,4-Dimethylacetophenone, Isoeugenol, Safrole, Methyl 2-octynoate, o-Methylanisole, p-Cresyl methyl ether, Ethyl anthranilate, Linalool, Phenyl butyrate, Ethylene glycol dibutyrate, Diethyl phthalate, Phenyl mercaptan, Cumic alcohol, m-Toluquinoline, 6-Methylquinoline, Lepidine, 2-Ethylbenzaldehyde, 4-Ethylbenzaldehyde, o-Ethylphenol, p-Ethylphenol, m-Ethylphenol, (+)-Pulegone, 2,4-Dimethylbenzaldehyde, Isoxylaldehyde, Ethyl sorbate, Benzyl propionate, 1,3-Dimethylbutyl acetate, Isobutyl isobutanoate, 2,6-Xylenol, 2,4-Xylenol, 2,5-Xylenol, 3,5-Xylenol, Methyl cinnamate, Hexyl methyl ether, Benzyl ethyl ether, Methyl salicylate, Butyl propyl ketone, Ethyl amyl ketone, Hexyl methyl ketone, 2,3-Xylenol, 3,4-Xylenol, Cyclopentadenanolide and Phenyl ethyl 2 phenylacetate 2.

**[0111]** It is commonplace for a plurality of perfume components to be present in a formulation. In the compositions for use in the present invention it is envisaged that there will be four or more, preferably five or more, more preferably six or more or even seven or more different perfume components from the list given of delayed blooming perfumes given above and/or the list of perfume components with a ClogP above 3 present in the perfume.

**[0112]** Another group of perfumes with which the present invention can be applied are the so-called 'aromatherapy' materials. These include many components also used in perfumery, including components of essential oils such as Clary Sage, Eucalyptus, Geranium, Lavender, Mace Extract, Neroli, Nutmeg, Spearmint, Sweet Violet Leaf and Valerian.

#### **Further Optional Ingredients**

**[0113]** The compositions for use in the invention may contain one or more other ingredients. Such ingredients include further preservatives (e.g. bactericides), pH buffering agents, perfume carriers, hydrotropes, anti-redeposition agents, soil-release agents, polyelectrolytes, anti-shrinking agents, anti-wrinkle agents, antioxidants, sunscreens, anti-corrosion agents, drape imparting agents, anti-static agents, ironing aids, silicones, antifoams, colourants, pearlisers and/or opacifiers, natural oils/extracts, processing aids, e.g. electrolytes, hygiene agents, e.g. antibacterials and antifungals, thickeners and skin benefit agents.

#### **Product Form**

**[0114]** The compositions for use in the present invention are preferably rinse-added softening compositions.

**[0115]** The compositions have a pH ranging from about 2.5 to 6, preferably from about 2.5 to 4.5, most preferably about 2.5 to 2.8. The compositions for use in the invention may also contain pH modifiers such as hydrochloric acid or lactic acid.

**[0116]** A composition for use in the invention is preferably in liquid form. The composition may be a concentrate to be diluted in a solvent, including water, before use. The composition may also be a ready-to-use (in-use) composition. Preferably the composition is provided as a ready to use liquid comprising an aqueous phase. The aqueous phase may comprise water-soluble species, such as mineral salts or short chain (C<sub>1-4</sub>) alcohols.

**[0117]** 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. Alternatively, it can be diluted prior to use. The compositions may also be used in a domestic hand-washing laundry operation. It is also possible for the compositions of the present invention to be used in industrial laundry operations, e.g. as a finishing agent for softening new clothes prior to sale to consumers.

#### **Preparation of the compositions of the invention**

**[0118]** Fabric conditioner compositions for use in the invention may typically be made by combining a melt comprising the fabric softening active and co-softener with an aqueous phase. Further components may be combined with the water phase, or may be post dosed into the composition after combination of the melt and water phase.

**Examples**

[0119] Embodiments of the invention will now be illustrated by the following non-limiting examples. Further modifications will be apparent to the person skilled in the art.

[0120] Examples of the invention are represented by a number. Comparative examples are represented by a letter.

[0121] Unless otherwise stated, amounts of components are expressed as a percentage of the total weight of the composition.

**Example 1:- Fabric conditioner and polymers used for the treatment of fabric**

[0122] To illustrate the dye fixing properties of the cationic polymer as used in accordance with the invention, fabric was treated with fabric conditioner and polymer solution in the final rinse of a wash process.

[0123] The composition of the fabric conditioner is given in Table 1 below:-

**Table 1: Fabric conditioner composition**

Ingredient	Level % (on 100% active basis)
Hardened tallow triethanolamine quat (HTEAQ) <sup>1</sup>	12.1
Coco 20EO alkyl ethoxylate <sup>2</sup>	0.36
35/65 C16/18 fatty alcohol <sup>3</sup>	0.953
Perfume <sup>4</sup>	0.71
Water and minors	To 100%
<sup>1</sup> UL90, ex Stepantex <sup>2</sup> Fatty alcohol, Stenol1618L <sup>3</sup> Genapol C200 <sup>4</sup> Milofiore, ex IFF	

[0124] The polymers used to treat the fabrics are given in Table 2 below:-

**Table 2: Type and supplier of polymers used**

Polymer	Type	Supplier
UCARE™ LR400 <sup>1</sup>	Cationic cellulose derivative	Dow-Amerchol
N-Hance™ BF 13 <sup>2</sup>	Cationic polysaccharide/guar gum	Aqualon
<sup>1</sup> LR400 is a partially cationically substituted quaternary ammonium material in accordance with the invention, specifically a polyquaternium 10 compound. It is a cellulose ether with a-[2-hydroxy-3-(trimethylammonio)propyl]-w-hydroxypolypoly(oxy-1,2-ethanediyl) chloride. It has a linear polysaccharide structure. <sup>2</sup> N-Hance™ BF 13 is a partially cationic substituted quaternary ammonium material outside the scope of the invention. CAS Name: guar hydroxypropyltrimonium chloride; CAS No. 65497-29-2. Guar gum, has a branched polysaccharide structure.		

[0125] The polymers were used as a 1 % solution of polymer in water.

**Example 2:- Treatment of cloths with Composition 1 and Comparative Examples A-D**

[0126] A multi-wash experiment was conducted using Tergo washes using the following protocol:-

[0127] Three woven cotton cloths measuring 15 x 15 cm, dyed with Direct Green 26 dye (specifically woven mercerised cotton, dyed with 1.5% Solophenyl Green BL, with a resin finish), and three undyed white woven cotton cloths were placed in a Tergotometer.

[0128] A wash, followed by two water rinses and a final treatment rinse were performed. In the final treatment rinse, fabric conditioner and cationic polymer (1 %) were added separately over the side.

[0129] The conditions used were as follows:-

**Wash Conditions**

## EP 2 561 057 B1

Water volume	1 litre
Water hardness	26°FH
Wash temperature	40°C
Wash time	30 min
Agitation rate	100 rpm
Wash product	Persil Colour powder (commercial)
Wash product dosage	1.2 g

### Water Rinses Conditions

Water volume	1 litre
Rinse time	5 min
Agitation rate	100 rpm

### Final Treatment Rinse Conditions

Water volume	1 litre
Rinse time	5 min
Agitation rate	100 rpm

**[0130]** A total of five washes were performed, in which the dyed (Direct Green 26) fabric pieces were carried forward in all 5 washes whilst fresh white fabric pieces were used for each wash.

**[0131]** Details of the dosages used are given in Table 3 below.

**[0132]** The cloths were then removed, spun and line dried.

**Table 3: Dosage of fabric conditioner and polymer solution**

Tergo Pot	Fab Con dosage	UCare LR400	N-Hance BF 13
A Water Rinse (control)	0	0	0
B	0.55 g	0	0
1	0.55 g	0.55 g	0
C	0.55 g	0	0.55 g
D (High dose)	0.82 g	0	0

### Example 3:- Dye fixation

**[0133]** Dye fixation levels in the cloths treated in Example 2 above were measured by reflectance (Delta E at 420 nm). The reflectance measurement was carried out using an Ultrascan XE to measure Delta E at 420 nm, with a UV filter in place. Delta E measurements were taken for the white cloths to give a measure of the amount of green dye that had transferred to the white fabric.

**[0134]** The results are shown in Table 4 below. The results are shown as differences from standard fabric conditioner, with a positive value indicating a benefit. A lower score corresponds to reduced dye pick up, so indicates a better result.

**Table 4: Delta E at 420 nm of each cloth for compositions 1 and A-D**

Average of 3 cloths per wash					
Product	A	B	1	C	D
	Water Rinse (control)	Fab Con only	Fab Con + LR400	Fab Con + AQU D-4051	Fab Con (High dose)
1 Wash	n/a	n/a	n/a	n/a	n/a
2 wash	14.1	15.28	14.2	14.67	15.63

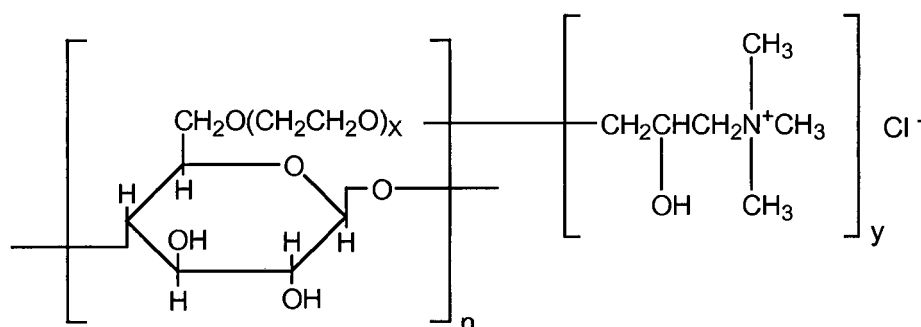
(continued)

Average of 3 cloths per wash					
Product	A	B	1	C	D
	Water Rinse (control)	Fab Con only	Fab Con + LR400	Fab Con + AQU D-4051	Fab Con (High dose)
3 wash	11.67	12.25	8.54	12.55	12.3
4 wash	9.88	10.33	7.2	9.94	9.7
5 wash	8.65	9.2	6.36	8.86	8.85

[0135] It will be seen that UCare LR400 gave the best dye fixation.

## Claims

1. Use of a cationic polymer in the treatment of textiles to improve dye fixation in textiles, wherein the cationic polymer is a linear cationically substituted quaternary ammonium salt according to the following Formula (I):



wherein, x is from 0 to 3 and the ratio of y:n is in the range of from 0.01 - 0.5 (i.e. n:y is from 100 to 2), provided that y ≠ n, wherein the cationic polymer is comprised in a textile treatment composition at a level of from 0.001 % to 1 % by weight of the total composition, **characterised in that** the textile treatment composition comprises a fabric softening active, selected

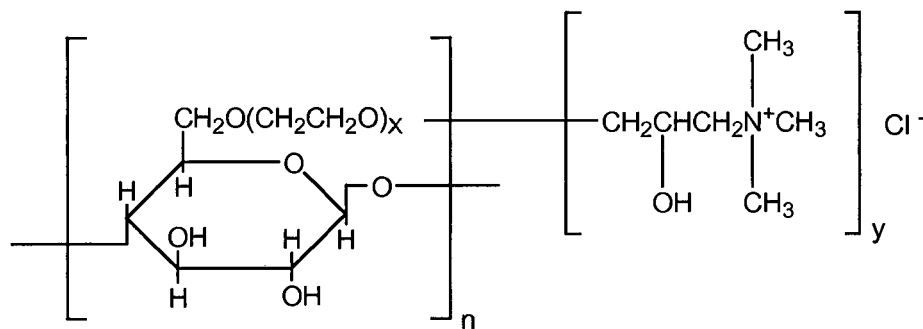
from an oily sugar derivative, a cationic fabric softening compound and mixture thereof, and wherein the treatment comprises rinsing a fabric in the textile treatment composition to deposit fabric conditioner and polymer thereon such that a dye fixing benefit is apparent in subsequent washes.

2. Use as claimed in claim 1, wherein x is from 0 to 1.
3. Use as claimed in claim 1 or claim 2, wherein the cationic polymer has a molecular weight in the range of from 1,000 to 1,000,000 kDa.
4. Use as claimed in any preceding claim, wherein the ratio of unquaternised to quaternised sugar units (n:y) is in the range of from 3 to 30.
5. Use as claimed in any preceding claim, wherein the level of nitrogen in the cationic polymer is in the range of from 0.1 to 1.5 % by total weight of the polymer.
6. Use as claimed in claim 1, wherein the cationic polymer is selected from Polyquaternium 10, UCARE Polymer JR-400, UCARE Polymer LR-400, their copolymers and mixtures thereof.
7. Use as claimed in any preceding claim, wherein the fabric softening active is a quaternary ammonium compound.
8. Use as claimed in claim 7, wherein the quaternary ammonium compound is an ester-linked compound comprising a distribution of monoester, diester and triester compounds.

9. Use as claimed in claim 8, wherein the ester-linked compound is an ester-linked triethanolamine quaternary ammonium compound.
10. Use as claimed in any preceding claim, wherein the fabric softening active is present in an amount of from 3 to 50 %, preferably 4 to 40, more preferably 5 to 25, by weight of the total composition.
11. Use as claimed in any preceding claim, wherein the composition additionally comprises one or more ingredients selected from perfume, non-ionic surfactant, fatty acid, fatty alcohol and viscosity modifier.

Patentansprüche

1. Verwendung eines kationischen Polymers bei der Behandlung von Textilerzeugnissen, um die Farbstofffixierung bei Textilerzeugnissen zu verbessern, wobei das kationische Polymer ein lineares, kationisch substituiertes quaternäres Ammoniumsalz gemäß der folgenden Formel (I) ist:



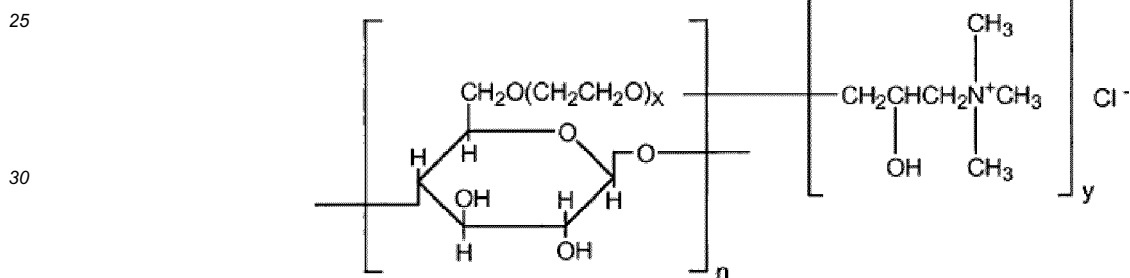
worin x gleich 0 bis 3 ist und das Verhältnis y:n im Bereich von 0,01 bis 0,5 liegt (d.h. n:y gleich 100 bis 2 ist), mit der Maßgabe, dass  $y \neq n$  ist, wobei das kationische Polymer in einer Textilbehandlungszusammensetzung in einer Menge von 0,001 bis 1 Gew.-% der gesamten Zusammensetzung vorliegt, **dadurch gekennzeichnet, dass** die Textilbehandlungszusammensetzung einen Weichmacherwirkstoff für Textilerzeugnisse aufweist, der aus einem öligen Zuckerderivat, einer kationischen Weichmacherverbindung für Textilerzeugnisse und einem Gemisch davon ausgewählt ist, und wobei das Behandeln das Spülen des Textilerzeugnisses in der Textilbehandlungszusammensetzung aufweist, um Textilweichmacher und Polymer darauf abzulagern, so dass der Vorteil der Farbstofffixierung bei nachfolgenden Wäschen deutlich wird.

2. Verwendung nach Anspruch 1, wobei x gleich 0 bis 1 ist.
3. Verwendung nach Anspruch 1 oder 2, wobei das kationische Polymer ein Molekulargewicht im Bereich von 1000 bis 1000000 kDa aufweist.
4. Verwendung nach einem der vorstehenden Ansprüche, wobei das Verhältnis zwischen den nicht-quaternisierten und den quaternisierten Zuckereinheiten (n:y) im Bereich von 3 bis 30 liegt.
5. Verwendung nach einem der vorstehenden Ansprüche, wobei die Stickstoffmenge im kationischen Polymer im Bereich von 0,1 bis 1,5 % liegt, und zwar auf das Gesamtgewicht des Polymers bezogen.
6. Verwendung nach Anspruch 1, wobei das kationische Polymer aus Polyquaternium 10, UCARE Polymer JR-400, UCARE Polymer LR-400, deren Copolymeren und Gemischen davon ausgewählt ist.
7. Verwendung nach einem der vorstehenden Ansprüche, wobei der Weichmacherwirkstoff für Textilerzeugnisse eine quaternäre Ammoniumverbindung ist.

8. Verwendung nach Anspruch 7,  
wobei die quaternäre Ammoniumverbindung eine Ester-gebundene Verbindung ist, die eine Verteilung von Monoester-, Diester- und Triesterverbindungen aufweist.
- 5 9. Verwendung nach Anspruch 8,  
wobei die Ester-gebundene Verbindung eine Ester-gebundene, auf Triethanolamin basierende quaternäre Ammoniumverbindung ist.
10. Verwendung nach einem der vorstehenden Ansprüche,  
wobei der Weichmacherwirkstoff für Textilerzeugnisse in einer Menge von 3 bis 50 %, vorzugsweise von 4 bis 40  
10 %, stärker bevorzugt von 5 bis 25 % vorliegt, und zwar auf das Gewicht der gesamten Zusammensetzung bezogen.
11. Verwendung nach einem der vorstehenden Ansprüche,  
wobei die Zusammensetzung ferner einen oder mehrere Bestandteile aufweist, die aus Duftstoff, nichtionischem  
15 Tensid, Fettsäure, Fettalkohol und Viskositätsverbesserer ausgewählt sind.

### Revendications

- 20 1. Utilisation d'un polymère cationique dans le traitement de textiles pour améliorer la fixation de colorant dans les textiles, dans laquelle le polymère cationique est un sel d'ammonium quaternaire linéaire cationiquement substitué selon la formule (I) suivante :



- 35 dans laquelle, x est de 0 à 3 et le rapport de y:n se trouve dans l'intervalle de 0,01 - 0,5 (c'est-à-dire n:y est de 100 à 2), à condition que  $y \neq n$ , dans laquelle le polymère cationique est constitué d'une composition de traitement de textile à une teneur de 0,001 % à 1 % en poids de la composition totale, **caractérisée en ce que** la composition de traitement de textiles comprend un actif d'adoucisseur de tissu, choisi parmi un dérivé huileux du sucre, un composé d'adoucisseur de tissu cationique et un mélange de ceux-ci, et dans laquelle le traitement comprend le rinçage d'un tissu dans la composition de traitement de textile pour déposer un conditionnant de tissu et un polymère sur son dessus de sorte qu'un bénéfice de fixation de colorant apparaît dans des lavages subséquents.

2. Utilisation selon la revendication 1, dans laquelle x est de 0 à 1.
- 45 3. Utilisation selon la revendication 1 ou la revendication 2, dans laquelle le polymère cationique présente une masse moléculaire dans l'intervalle de 1 000 à 1 000 000 kDa.
4. Utilisation selon l'une quelconque des revendications précédentes, dans laquelle le rapport d'unités de sucre non quaternisées à quaternisées (n:y) se trouve dans l'intervalle de 3 à 30.
- 50 5. Utilisation selon l'une quelconque des revendications précédentes, dans laquelle la teneur en azote dans le polymère cationique se trouve dans l'intervalle de 0,1 à 1,5 % en poids total du polymère.
6. Utilisation selon la revendication 1, dans laquelle le polymère cationique est choisi parmi Polyquaternium 10, UCARE Polymer JR-400, UCARE Polymer LR-400, leurs copolymères et mélanges de ceux-ci.
- 55 7. Utilisation selon l'une quelconque des revendications précédentes, dans laquelle la matière active d'adoucisseur de tissu est un composé d'ammonium quaternaire.



## EP 2 561 057 B1

8. Utilisation selon la revendication 7, dans laquelle le composé d'ammonium quaternaire est un composé lié à un ester comprenant une distribution de composés monoester, diester et triester.

5 9. Utilisation selon la revendication 8, dans laquelle le composé lié à un ester est un composé d'ammonium quaternaire de triéthanolamine lié à un ester.

10 10. Utilisation selon l'une quelconque des revendications précédentes, dans laquelle la matière active d'adoucisseur de tissu est présente dans une quantité de 3 à 50 %, de préférence de 4 à 40, encore mieux de 5 à 25, en poids de la composition totale.

15 11. Utilisation selon l'une quelconque des revendications précédentes, dans laquelle la composition comprend de plus un ou plusieurs ingrédients choisis parmi un parfum, un tensioactif non ionique, un acide gras, un alcool gras et un agent de modification de la viscosité.

20

25

30

35

40

45

50

55

**REFERENCES CITED IN THE DESCRIPTION**

*This list of references cited by the applicant is for the reader's convenience only. It does not form part of the European patent document. Even though great care has been taken in compiling the references, errors or omissions cannot be excluded and the EPO disclaims all liability in this regard.*

**Patent documents cited in the description**

- WO 04056888 A [0003]
- WO 9746650 A [0004]
- WO 9746651 A [0004]
- WO 9746652 A [0004]
- WO 9746654 A [0004]
- WO 9927049 A, Procter and Gamble [0005]
- WO 9812295 A [0006]
- WO 9812296 A, Procter and Gamble [0006]
- WO 9820098 A [0007]
- WO 9820099 A, Procter and Gamble [0007]
- WO 200131116 A, Procter and Gamble [0008]
- DE 19643281 [0009]
- US 20060223739 A, Unilever [0010]
- US 4137180 A, Lever Brothers [0038]
- US 4386213 A [0058]
- AU 1441688 [0058]
- WO 0146361 A, Unilever [0068]
- WO 2006024612 A [0087]
- WO 2006055787 A [0101]
- US 5578563 A [0109]

**Non-patent literature cited in the description**

- **JOHNSON ; SHOOLERY.** *Anal. Chem.*, 1962, vol. 34, 1136 [0042]
- Fenaroli's Handbook of Flavor Ingredients. CRC Press, 1975 [0104]
- **M. B. JACOBS.** *Synthetic Food Adjuncts.* 1947 [0104]
- **S. ARCTANDER.** *Perfume and Flavor Chemicals.* Montclair, N.J, 1969 [0104]
- **POUCHER.** *Journal of the Society of Cosmetic Chemists*, 1955, (2), 80 [0106]