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(54) **Title**: FABRIC CONDITIONERS

(57) **Abstract**: A process for the preparation of an aqueous fabric conditioner composition comprising:- (a) preparing a fabric conditioner base; (b) preparing a premix of a hydrophobic agent with a perfume; and (c) combining the premix of step (b) with the base of step (a); wherein the fabric conditioner base comprises from 2 to 9 wt % of a fabric softening active, by weight of the total aqueous fabric conditioner composition, which is an ester-linked quaternary ammonium compound having fatty acid chains comprising from 20 to 35 wt % of saturated C18 chains and from 20 to 35 wt % of monounsaturated C18 chains, by weight of total fatty acid chains; and wherein the hydrophobic agent has a ClogP of from 4 to 9; and the aqueous fabric conditioner composition has a stable viscosity of greater than 50 cps, preferably from 55 to 200 cps as measured on a cup and bob viscometer; the viscosity being continuously measured under shear at $106s^{-1}$ for 60 seconds, at 25°C.

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FABRIC CONDITIONERS

Technical Field

The present invention relates to a process for manufacturing stable fabric conditioner compositions containing unsaturated TEA quaternary ammonium compounds, a perfume and a hydrophobic agent and the compositions obtained therefrom.

Background and Prior Art

The rheological properties of liquid fabric softening compositions are critical for consumer acceptance. A common method of enhancing product appeal and conveying a perception of product richness and efficacy is to increase the apparent thickness of the liquid product. The viscosity of a fabric conditioner also affects its pourability and flowability characteristics. Indeed, the majority of consumers demonstrate a preference for thicker products over thin products.

One of the problems associated with fabric softening compositions is the physical instability of such compositions when stored. Physical instability of compositions manifests as a decrease or increase in viscosity to a level which is unacceptable, in view of consumer preferences. Unacceptable levels of thickening, leading to gelling and phase separation can also occur as a result of storage over time, particularly under variable temperature conditions.

In the past, physical stability of rinse added fabric softener compositions has been improved by the addition of viscosity control agents or anti-gelling agents. In EP 280550 (Unilever) it has been proposed to improve the physical stability of dilute compositions comprising biodegradable, ester-linked quaternary ammonium compounds and fatty acid by the addition of nonionic surfactants.

It is also known from EP 13780 (Procter & Gamble) to form concentrated aqueous liquid fabric softening compositions from a mixture of a water-insoluble, cationic material and a nonionic material selected from hydrocarbons, fatty acids, fatty esters and fatty alcohols; the nonionic material acting to improve the viscosity characteristics of a product when the level of cationic material is above 8%.

It is also known from GB 2039556 and EP 13780 that preferred compositions can also include low levels of electrolyte such as respectively sodium chloride or calcium chloride, to further control product viscosity.

EP2053119 (Procter & Gamble) discloses a fabric softening composition comprising a fabric softening active and a hydrophobic ester having a Clog P of greater than 4 and a chelant, the composition being essentially free of non-ionic surfactant. The compositions are purported to have improved storage stability and improved resistance to shear.

We have now found that the processing method used in the production of fabric conditioners comprising specific ester-linked fabric softening actives, wherein the fabric softening active has fatty acid chains comprising from 20 to 35 wt % of saturated C18 chains and from 20 to 35 wt % of monounsaturated C18 chains, by weight of total fatty acid chains, a hydrophobic agent and a perfume has an unexpectedly big impact on the physical stability of the end product. We have found that where the hydrophobic agent is blended with the perfume prior to addition to the fabric conditioner active, a product of superior stability is formed.

Statement of the Invention

In a first aspect of the invention there is provided a process for the preparation of an aqueous fabric conditioner composition comprising:-

(a) preparing a fabric conditioner base;
(b) preparing a premix of a hydrophobic agent with a perfume; and
(c) combining the premix of step (b) with the base of step (a);

wherein the fabric conditioner base comprises from 2 to 9 wt % of a fabric softening active, by weight of the total aqueous fabric conditioner composition, which is an ester-linked quaternary ammonium compound having fatty acid chains comprising from 20 to 35 wt % of saturated C18 chains and from 20 to 35 wt % of monounsaturated C18 chains, by weight of total fatty acid chains; and

wherein the hydrophobic agent has a ClogP of from 4 to 9; and

the aqueous fabric conditioner composition has a stable viscosity of greater than 50 cps, preferably from 55 to 200 cps as measured on a cup and bob viscometer; the viscosity being continuously measured under shear at $106s^{-1}$ for 60 seconds, at 25°C.

There is also provided in a second aspect, a composition obtainable by the process according to the first aspect of the invention.

Detailed Description of the Invention

The Process

The process is for the preparation of an aqueous fabric conditioner composition having a stable viscosity of greater than 50 cps, preferably from 55 to 200 cps as measured on a cup and bob viscometer; the viscosity being continuously measured under shear at $106s^{-1}$ for 60 seconds, at 25°C.

The process comprises:-

(a) preparing a fabric conditioner base;
(b) preparing a premix of a hydrophobic agent with a perfume; and
(c) combining the premix of step (b) with the base of step (a).

The fabric conditioner base comprises from 2 to 9 wt % of a fabric softening active, by weight of the total aqueous fabric conditioner composition, which is an ester-linked quaternary ammonium compound having fatty acid chains comprising from 20 to 35 wt % of saturated C18 chains and from 20 to 35 wt % of monounsaturated C18 chains, by weight of total fatty acid chains; and the hydrophobic agent has a ClogP of from 4 to 9.

Preferably, step (a) comprises:-

(i) providing the fabric softening active in liquid form;
(ii) providing an aqueous phase at a temperature of from 20 to 70°C; and
(iii) combining the fabric softening active of step (i) with the aqueous phase of step (ii) with agitation.

Preferably, step (i) comprises combining the fabric softening active with a co-active to form a liquid mixture. Suitable co-actives are described herein below.

The Composition

The aqueous fabric conditioner composition of the invention has a viscosity of greater than 50 cps, preferably from 55 to 200 cps, more preferably from 60 to 175, even more preferably from 80 to 150 and most preferably from 100 to 140 cps as measured on a “cup and bob” viscometer; the viscosity being continuously measured under shear at $106s^{-1}$ for 60 seconds, at 25°C. Any suitable viscometer can be used, for example, the Haake VT550 with a MV1 cup and bob geometry and the Thermo Fisher RS600 viscometer. The compositions of the invention have superior viscostability, which is apparent upon storage of the compositions.

The aqueous fabric conditioner composition of the invention preferably comprises at least 75 wt % of water, more preferably from 80 to 97 wt % water and most preferably from 90 to 96 wt % water, by weight of the total composition.

The Fabric Softening Active

The fabric softening active is an ester-linked quaternary ammonium compound (QAC). The fatty acid chains of the QAC comprise from 20 to 35 wt % of saturated C18 chains and from 20 to 35 wt % of monounsaturated C18 chains by weight of total fatty acid chains.

Preferably, the QAC is derived from palm or tallow feedstocks. These feedstocks may be pure or predominantly palm or tallow based. Blends of different feedstocks may be used.

In a preferred embodiment, the fatty acid chains of the QAC comprise from 25 to 30 wt %, preferably from 26 to 28 wt % of saturated C18 chains and from 25 to 30 wt %, preferably from 26 to 28 wt % of monounsaturated C18 chains, by weight of total fatty acid chains.

In a further preferred embodiment, the fatty acid chains of the QAC comprise from 30 to 35 wt %, preferably from 33 to 35 wt % of saturated C18 chains and from 24 to 35 wt %, preferably from 27 to 32 wt % of monounsaturated C18 chains, by weight of total fatty acid chains.

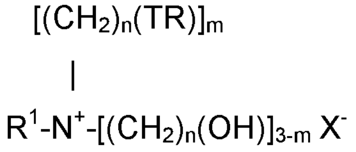
The fabric softening active, for use in the fabric conditioner compositions of the present invention is preferably an ester-linked triethanolamine (TEA) based quaternary ammonium compound.

Ester-linked triethanolamine quaternary ammonium compounds comprise a mixture of mono-, di- and tri-ester linked components. The triester content is preferably below 10 wt %, more preferably from 5 to 9 wt % by total weight of the quaternary active component. Preferred ester-linked triethanolamine quaternary ammonium compounds have a diester content of from 50 to 60 wt %, more preferably from 52 to 59 wt % by total weight of the quaternary active component. Also preferred are TEA quats having a monoester content of from 30 to 45 wt %, more preferably from 32 to 42 wt % by total weight of the quaternary active component.

A preferred TEA quat of the present invention comprises from 32 to 42 wt % of monoester, from 52 to 59 wt % of diester and from 5 to 9 wt % of triester compounds, by total weight of the quaternary active; more preferably from 35 to 39 wt % of monoester, from 54 to 58 wt % of diester and from 7 to 8 wt % of triester compounds, by total weight of the quaternary active component.

The quaternary ammonium materials for use in the compositions are known as “soft” materials. 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. The preferred quaternary ammonium materials for use in the present invention can be derived from feedstock having an overall iodine value of from 30 to 45, preferably from 30 to 42 and most preferably 36.

Quaternary ammonium compounds (QACs) suitable for use in the present invention can be represented by formula (I)



$$\begin{array}{l} \quad [(CH_2)_n(TR)]_m \\ \qquad | \\ R^1\text{-}N^+\text{-}[(CH_2)_n(OH)]_{3-m}\ X^- \end{array} \qquad (I)$$

wherein,
each R is independently selected from a C_{5-35} alkyl or alkenyl group and is selected to result in from 20 to 35 wt % of saturated C18 chains and from 20 to 35 wt % of monounsaturated C18 chains, by weight of total fatty acid chains;
R^1 represents a C_{1-4} alkyl, C_{2-4} alkenyl or a C_{1-4} 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, preferably a halide or alkyl sulphate, e.g. chloride or methylsulphate.

Preferred quaternary ammonium actives according to Formula 1 are available, for example, TEP-88L available from FXG (Feixiang Chemicals (Zhangjiagang) Co., Ltd., China; Stepantex SP88-2 and Stepantex VT-90 ex Stepan; Tetranyl L1/90N ex Kao, Rewoquat V10058 ex Evonik and Prapegen TQN ex Clariant.

A second group of QACs suitable for use in the invention is represented by Formula (II):

$$(R^1)_2\text{-}N^+\text{-}[(CH_2)_n\text{-}T\text{-}R^2]_2\ X^- \qquad (II)$$

wherein each R^1 group is independently selected from C_{1-4} alkyl, or C_{2-4} alkenyl groups; and wherein each R^2 group is independently selected from C_{8-28} alkyl or alkenyl groups; and n, T, and X^- are as defined above.

Preferred materials of this second group include bis(2-tallowoyloxyethyl)dimethyl ammonium chloride.

The fabric conditioning compositions of the invention are "dilute" and comprise from 2 to 9 wt %, preferably from 3 to 8 wt %, most preferably from 4 to 6 wt %, of a fabric softening active, by weight of the total composition.

The Hydrophobic Agent

The hydrophobic agent is present in an amount of from 0.05 to 1.0 wt %, preferably from 0.1 to 0.8 wt %, more preferably from 0.2 to 0.7 and most preferably from 0.4 to 0.7 wt % by weight of the total composition, for example from 0.2 to 0.5 wt %.

The hydrophobic agent has a ClogP of from 4 to 9, preferably from 4 to 7, most preferably from 5 to 7.

Suitable hydrophobic agents include esters derived from the reaction of a fatty acid with an alcohol. The fatty acid preferably has a carbon chain length of from C8 to C22 and may be saturated or unsaturated, preferably saturated. Some examples include stearic acid, palmitic acid, lauric acid and myristic acid. The alcohol may be linear, branched or cyclic. Linear or branched alcohols have a preferred carbon chain length of from 1 to 6. Preferred alcohols include methanol, ethanol, propanol, isopropanol, sorbitol. Preferred hydrophobic agents include methyl esters, ethyl esters, propyl esters, isopropyl esters and sorbitan esters derived from such fatty acids and alcohols.

Non-limiting examples of suitable hydrophobic agents include methyl esters derived from fatty acids having a carbon chain length of from at least C_{10}, ethyl esters derived from fatty acids having a carbon chain length of from at least C_{10}, propyl esters derived from fatty acids having a carbon chain length of from at least C_8, isopropyl esters derived from fatty acids having a carbon chain length of from at least C_8, sorbitan esters derived from fatty acids having a carbon chain length of from at least C_{16}, and alcohols with a carbon chain length greater than C_{10}. Naturally occurring fatty acids commonly have a carbon chain length of up to C_{22}.

Some preferred materials include methyl undecanoate, ethyl decanoate, propyl octanoate, isopropyl myristate, sorbitan stearate and 2-methyl undecanol, ethyl myristate, methyl myristate, methyl laurate, isopropyl palmitate and ethyl stearate; more preferably methyl undecanoate, ethyl decanoate, isopropyl myristate, sorbitan stearate, 2-methyl undecanol, ethyl myristate, methyl myristate, methyl laurate and isopropyl palmitate.

Non-limiting examples of such materials include methyl undecanoate (ClogP of 4.6), ethyl decanoate (having a ClogP of 4.9), propyl octanoate (ClogP of 4.1), isopropyl myristate (ClogP of 6.4), sorbitan stearate (ClogP of 5.6) and 2-methyl undecanol (having a ClogP of 5.0); preferably methyl undecanoate, ethyl decanoate, isopropyl myristate (ClogP of 6.4), sorbitan stearate (ClogP of 5.6) and 2-methyl undecanol (having a ClogP of 5.0).

Most preferably, the hydrophobic agent is isopropyl myristate.

The hydrophobic agent is preferably a liquid at or below 45 °C, preferably at about from 20 to 30 °C.

The hydrophobic agent is not intended to be a fatty alcohol.

The hydrophobic agent is an uncharged species. The hydrophobic agent is not intended to be an esterquat.

The Perfume

The compositions of the present invention comprise one or more perfumes. 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 0.05 to 2 %, most preferably from 0.05 to 1.5 % by weight, based on the total weight of the composition.

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.

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’.

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 and in those embodiments of the invention which contain an increased level of top-notes it is envisaged at that least 20%wt would be present within the encapsulate.

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, preferably 100-250 Celsius and pro-fragrances which can produce such components.

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:

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

Ethyl Dimethyl Carbinol, Prenyl Acetate, Propyl Bornate, Pulegone, Rose Oxide, Safrole, 4-Terpinenol, Alpha-Terpinenol, and/or Viridine.

Preferred non-encapsulated perfume ingredients are those hydrophobic perfume components with a ClogP above 3. As used herein, the term "ClogP" means the calculated logarithm to base 10 of the octanol/water partition coefficient (P). The octanol/water partition coefficient of a 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.

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, Geranial, 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, Isobutyl 2-butenoate, 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, Isopentyl 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.

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

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

Non-ionic alkoxylated material

The compositions of the invention may comprise a non-ionic alkoxylated material having an HLB value of from 8 to 18, preferably from 11 to 16, more preferably from 12 to 16 and most preferably 16. The addition of such a non-ionic material reduces the occurrence of flocculation when the composition is added to water, such as a rinse water.

The non-ionic alkoxylated material can be linear or branched, preferably linear.

The non-ionic alkoxylated material may be present in an amount of from 0.01 to 0.5 wt %, preferably from 0.02 to 0.4 wt %, more preferably from 0.05 to 0.25 wt % and most preferably 0.1 wt % by total weight of the composition.

Suitable non-ionic alkoxylated materials include nonionic surfactants. Suitable non-ionic surfactants include addition products of ethylene oxide and/or propylene oxide with fatty alcohols, fatty acids and fatty amines. The non-ionic alkoxylated material is 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.

Suitable surfactants are substantially water soluble surfactants of the general formula:

$$R\text{-}Y\text{-}(C_2H_4O)_z\text{-}CH_2\text{-}CH_2\text{-}OH$$

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.

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 or can be hydrogen; and Z is at least about 6, preferably at least about 10 or 11.

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

The addition of such a non-ionic material reduces the occurrance of flocculation when the composition is added to water, such as a rinse water.

Preferably, the non-ionic alkoxylated material is added to the aqueous phase.

Polymeric Thickening Agent

Thickening polymers may be added to the compositions of the invention for further thickening. Preferably, the optional thickening polymers are added to the aqueous phase. Any suitable thickener polymer may be used.

Suitable polymers are water soluble or dispersable. A high M.Wt, (for example, in the region of about 100,000 to 5,000,000) which can be achieved by crosslinking, is advantageous. Preferably, the polymer is cationic.

Polymers particularly useful in the compositions of the invention include those described in WO2010/078959 (SNF S.A.S.). These are crosslinked water swellable cationic copolymers having at least one cationic monomer and optionally other non-ionic and/or anionic monomers. Preferred polymers of this type are copolymers of acrylamide and trimethylaminoethylacrylate chloride.

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 relative to the polymer, preferably from 750 ppm to 5000 ppm, more preferably from 1000 to 4500 ppm (as determined by a suitable metering method such as that described on page 8 of patent EP 343840). The cross-linking agent concentration must be higher than about 500 ppm relative to the polymer, and preferably higher than about 750 ppm 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.

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.

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.

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.

The monomers may also contain hydrophobic groups.

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.

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

As described in US 2002/0132749 and Research Disclosure 429116, the degree of non-linearity 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.

The amount of polymer used in the compositions of the invention is suitably 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.

An example of a preferred polymer is Flosoft 270LS ex SNF.

Non-ionic Softener

The compositions of 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_8-C_{22} alkyl or alkenyl chain.

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.

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.

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_8 to C_{22} alkyl or alkenyl chain. The C_8 to C_{22} alkyl or alkenyl groups may be branched or linear carbon chains.

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.

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

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.

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

The ester or ether chains of the CPE or RSE are preferably predominantly unsaturated. Preferred CPEs or RSEs include sucrose tetratallowate, 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 monosaturated 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.

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.

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

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.

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.

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).

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.

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_1 position. Suitable examples of such compounds include methyl glucose derivatives.

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

The length of the unsaturated (and saturated if present) chains in the CPE or RSE is C_8-C_{22}, preferably C_{12}-C_{22}. It is possible to include one or more chains of C_1-C_8, however these are less preferred.

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_2 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_2 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_2 of less than 100 μs is considered to be a solid component and any component with $T_2 \geq 100$ 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.
The HLB of the CPE or RSE is typically between 1 and 3.

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%.

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

Shading Dyes

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

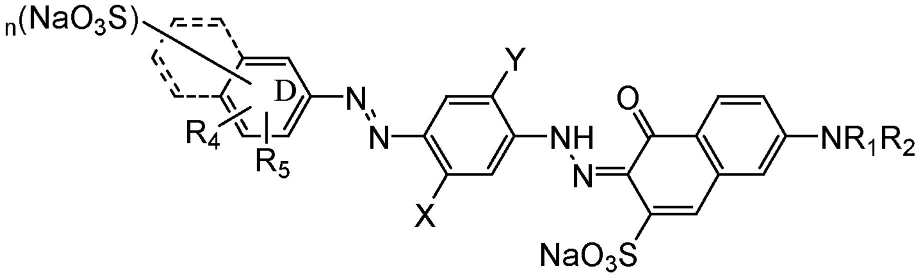
Different shading dyes give different levels of colouring. The level of shading dye present in the compositions of the present invention depend, therefore, on the type of shading dye. Preferred overall ranges, suitable for the present invention are from 0.00001 to 0.1 wt %, more preferably 0.0001 to 0.01 wt %, most preferably 0.0005 to 0.005 wt % by weight of the total composition.

Direct Dyes

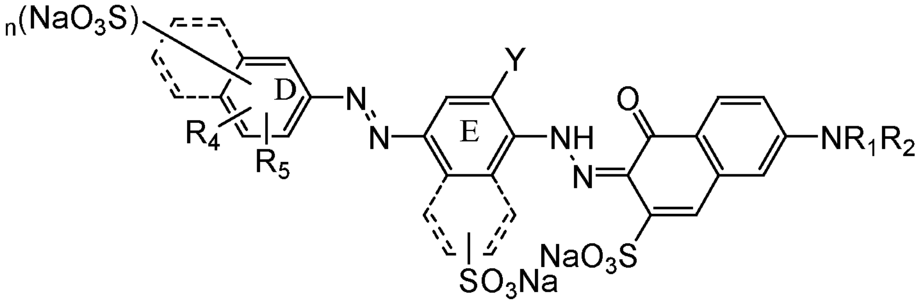
Direct dyes (otherwise known as substantive dyes) are the class of water soluble dyes which have a affinity for fibres and are taken up directly. Direct violet and direct blue dyes are preferred.

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

Most preferably, the direct dye is a direct violet of the following structures:



or



wherein:

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;

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.

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.

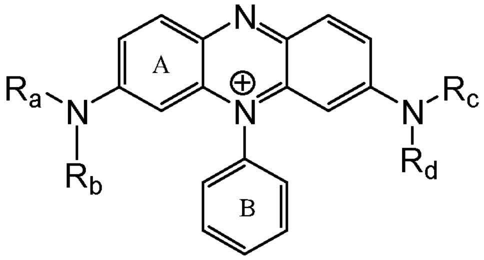
The benzidene based dyes are less preferred.

Preferably the direct dye is present at 0.00001 wt% to 0.0010 wt% of the formulation.

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

Acid Dyes

Cotton substantive acid dyes give benefits to cotton containing garments. Preferred dyes and mixes of dyes are blue or violet. Preferred acid dyes are:
(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, an branched or linear C1 to C7-alkyl chain, benzyl a phenyl, and a naphthyl;
the dye is substituted with at least one SO_3^- or $-COO^-$ 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 NO_2.

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

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

Preferably the acid dye is present at 0.0005 wt% to 0.01 wt% of the formulation.

Hydrophobic Dyes

The composition may comprise one or more hydrophobic dyes selected from benzodifuranes, methine, triphenylmethanes, napthalimides, pyrazole, napthoquinone, 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.

Preferred dyes include solvent violet 13, disperse violet 27 disperse violet 26, disperse violet 28, disperse violet 63 and disperse violet 77.

Preferably, where present, the hydrophobic dye is present at 0.0001 wt% to 0.005 wt% of the formulation.

Basic Dyes

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.

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

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.

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.

Preferred examples include reactive blue 19, reactive blue 163, reactive blue 182 and reactive blue, reactive blue 96.

Dye Conjugates

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

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. 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.

Co-softeners and fatty complexing agents

Co-softeners (also herein called co-actives) may be used. Suitable co-softeners include fatty acids. 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).

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).

The compositions for use in the present invention may comprise a fatty complexing agent.

Especially suitable fatty complexing agents include fatty alcohols.

Fatty complexing material may be used to improve the viscosity profile of the composition.

The fatty complexing agent is 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 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.

Further Optional Ingredients

The compositions of 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, anti-oxidants, sunscreens, anti-corrosion agents, drape imparting agents, anti-static agents, ironing aids pearlisers and/or opacifiers, natural oils/extracts, processing aids, e.g. electrolytes, hygiene agents, e.g. anti-bacterials and antifungals and skin benefit agents.

Product Form

The compositions of the present invention are aqueous fabric conditioning compositions suitable for use in a laundry process.

The compositions of the invention may also contain pH modifiers such as hydrochloric acid or lactic acid. The liquid compositions preferably have a pH of about 2.5 to 3.0.

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.

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

A preferred method of preparation for a dilute comprises the following steps:-

1. Melt the softening active and any co-active together to form a co-melt,
2. Heat the water to about 40 to 50°C to form an aqueous phase,
3. Add any non-ionic alkoxylated material and/or any polymer to the aqueous phase with agitation,
4. Add any minor ingredients to the aqueous phase,
5. Add the co-melt of step 1 to the aqueous phase,
6. Mix the hydrophobic agent with the perfume to form a premix,
7. Add the dye and the hydrophobic agent/perfume premix to the combined melt/water mixture with agitation, and
8. Cool.

Examples

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.

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

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

Example 1:- Preparation of Fabric Conditioner 1 in accordance with the invention and Comparative Examples A and B.

Compositions 1, A and B were dilute liquid fabric conditioners, comprising 4.5 % of active. The compositions are shown in Table 1.

Table 1: Compositions of the liquid fabric softeners 1, A and B.

Ingredient (wt %)	A	B	1
TEAQ2[1]	4.5	4.5	4.5
Fatty alcohol[2]	0.5	0.5	0.5
Perfume	0.4	0.4	0.4
Polymer[3]	0.2	0.2	0.2
Dye[4]	0.0076	0.0076	0.0076
HCl	to pH 2.5	to pH 2.5	to pH 2.5
Water & minors[5]	to 100	to 100	to 100
Lutensol AT25[6]	0.1	0.1	0.1
IPM[7]	-	0.2	0.2
Method of IPM[7] **addition**	-	separate	blended

[1] TEP-88L ex FXG (Feixiang Chemicals (Zhangjiagang) Co. Ltd., China

[2] Ginol 1618AT; ex Godrej

[3] Flosoft 270LS ex-SNF

[4] Liquitint dyes ex Milliken

[5] Antifoam, preservative, sequestrant

[6] Nonionic surfactant

[7] Isopropylmyristate

The compositions shown in Table 1 were prepared using the following method:

1. The water was heated to about 45 °C.
2. Non-ionic surfactant was then added to the heated water with stirring.
3. The polymer was then added to the water over about 1 minute with stirring and the mixture was mixed thoroughly.
4. The minor ingredients and acid were then added.
5. The softening active and fatty alcohol were melted together to form a co-melt.
6. The co-melt was then added to the heated water.
7. Dyes, perfumes and isopropylmyristate (IPM) were added.
8. The resultant composition was then cooled.

In the preparation of Composition 1, in accordance with the invention, the IPM was premixed with the perfume before addition in step 7.

In the preparation of Comparative Example B, the IPM was added separately from the perfume and other components at step 7.

Example 2:- Viscosities of Composition 1 and Comparative Examples A and B under storage

Viscosities

Viscosities of the freshly made dilute compositions were measured using a Haake VT550 with a MV1 “cup and bob” geometry and the viscosity continuously measured under shear at $106 s^{-1}$ for 60 seconds at 25°C.

The compositions were then stored at ambient temperature (20°C) for up to 85 days and the viscosities measured at intervals of 7, 27, 55 and 85 days, as described above. The results are given in Table 2 below.

Table 2: Viscosity data for fabric softeners 1, A and B after storage at 20°C for 7, 27, 55 and 85 days.

	Viscosity at 106 s^{-1} after Days at 20°C					
Composition	**Initial**	**7**	**27**	**55**	**85**	**Drop in Viscosity**
A (Control)	144	135	121	114	113	31
B (separate)	145	137	126	117	121	24
1 (blended)	120	117	112	109	111	9

It will be seen that the composition of the invention maintained a dramatically more stable viscosity than the comparative compositions.

CLAIMS

1. A process for the preparation of an aqueous fabric conditioner composition comprising:-

   (a) preparing a fabric conditioner base;
   (b) preparing a premix of a hydrophobic agent with a perfume; and
   (c) combining the premix of step (b) with the base of step (a);

   wherein the fabric conditioner base comprises from 2 to 9 wt % of a fabric softening active, by weight of the total aqueous fabric conditioner composition, which is an ester-linked quaternary ammonium compound having fatty acid chains comprising from 20 to 35 wt % of saturated C18 chains and from 20 to 35 wt % of monounsaturated C18 chains, by weight of total fatty acid chains; and

   wherein the hydrophobic agent has a ClogP of from 4 to 9; and

   the aqueous fabric conditioner composition has a stable viscosity of greater than 50 cps, preferably from 55 to 200 cps as measured on a cup and bob viscometer; the viscosity being continuously measured under shear at $106s^{-1}$ for 60 seconds, at 25°C.

2. A process as claimed in claim 1, wherein step (a) comprises:-

   (i) providing the fabric softening active in liquid form;
   (ii) providing an aqueous phase at a temperature of from 20 to 70°C; and
   (iii) combining the fabric softening active of step (i) with the aqueous phase of step (ii) with agitation.

3. A process as claimed in claim 2, wherein step (i) comprises combining the fabric softening active with a co-active to form a liquid mixture.

4. A process as claimed in any preceding claim, wherein the hydrophobic agent is present in an amount of from 0.05 to 1.0 wt % by weight of the total aqueous fabric conditioner composition.

5. A process as claimed in any preceding claim, wherein the hydrophobic agent has a ClogP of from 4.5 to 6.5.

6. A process as claimed in any preceding claim, wherein the hydrophobic agent is isopropyl myristate.

7. A process as claimed in any preceding claim, wherein the fabric conditioner base further comprises from 0.01 to 0.5 wt %, by weight of the total aqueous fabric conditioner composition, of a non-ionic alkoxylated material having an HLB value of from 8 to 18.

8. A process as claimed in any preceding claim, wherein the fatty acid chains of the quaternary ammonium compound comprise from 25 to 30 wt % of saturated C18 chains and from 25 to 30 wt % of monounsaturated C18 chains, by weight of total fatty acid chains.

9. A process as claimed in any preceding claim, wherein the fabric softening active is an ester-linked triethanolamine quaternary ammonium active compound.

10. A process as claimed in claim 9, wherein the fabric softening active is an ester-linked triethanolamine quaternary ammonium active compound having an ester distribution comprising from 32 to 42 % monoester, from 52 to 59 % diester and from 5 to 9 % triester compounds, by weight of total quaternary active.

11. A process as claimed in any preceding claim, wherein the fabric conditioner base further comprises a fatty alcohol.

12. A process as claimed in any preceding claim, wherein the fabric conditioner base further comprises a polymeric thickening agent in an amount of below 0.4 wt %, by weight of the total composition.

13. A process as claimed in claim 12, wherein the polymeric thickening agent is present in an amount of from 0.001 to 0.35 wt %, by weight of the total aqueous fabric conditioner composition.

14. A process as claimed in claim 12 or claim 13, wherein the polymeric thickening agent is cationic.

15. An aqueous fabric conditioner composition obtainable by the process according to any one of claims 1 to 14.

INTERNATIONAL SEARCH REPORT

International application No
PCT/EP2011/069414

A. CLASSIFICATION OF SUBJECT MATTER
INV. C11D1/62 C11D3/00 C11D3/20 C11D3/50
ADD.

According to International Patent Classification (IPC) or to both national classification and IPC

B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)
C11D

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

Electronic data base consulted during the international search (name of data base and, where practical, search terms used)

EPO-Internal, WPI Data

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
A	DE 10 2004 046282 A1 (SYMRISE GMBH & CO KG [DE]) 30 March 2006 (2006-03-30) example 8 -----	1-15
A	EP 2 053 119 A1 (PROCTER & GAMBLE [US]) 29 April 2009 (2009-04-29) cited in the application paragraphs [0012], [0023], [0033]; claims; examples -----	1-15
A	EP 1 279 726 A1 (GIVAUDAN SA [CH]) 29 January 2003 (2003-01-29) claims; examples -----	1-15
A	US 5 726 144 A (DEWEZ JACQUES [BE] ET AL) 10 March 1998 (1998-03-10) columns 5-6; claims; examples -----	1-15

☐ Further documents are listed in the continuation of Box C.

☒ See patent family annex.

* Special categories of cited documents :

"A" document defining the general state of the art which is not considered to be of particular relevance
"E" earlier document but published on or after the international filing date
"L" document which may throw doubts on priority claim(s) or which is cited to establish the publication date of another citation or other special reason (as specified)
"O" document referring to an oral disclosure, use, exhibition or other means
"P" document published prior to the international filing date but later than the priority date claimed

"T" later document published after the international filing date or priority date and not in conflict with the application but cited to understand the principle or theory underlying the invention
"X" document of particular relevance; the claimed invention cannot be considered novel or cannot be considered to involve an inventive step when the document is taken alone
"Y" document of particular relevance; the claimed invention cannot be considered to involve an inventive step when the document is combined with one or more other such documents, such combination being obvious to a person skilled in the art.
"&" document member of the same patent family

Date of the actual completion of the international search 2 February 2012	Date of mailing of the international search report 10/02/2012
Name and mailing address of the ISA/ European Patent Office, P.B. 5818 Patentlaan 2 NL - 2280 HV Rijswijk Tel. (+31-70) 340-2040, Fax: (+31-70) 340-3016	Authorized officer Pfannenstein, Heide

INTERNATIONAL SEARCH REPORT

Information on patent family members

International application No
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