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(54) **FABRIC CARE COMPOSITION**

ZUSAMMENSETZUNG ZUR TEXTILPFLEGE

COMPOSITION D'ENTRETIEN DE TISSUS

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Description

Technical Field

[0001] This invention relates to fabric care compositions and to methods of treating fabric using the compositions.

Background and Prior Art

[0002] The laundry process generally has several benefits for fabric, the most common being to remove dirt and stains from the fabric during the wash cycle and to soften the fabric during the rinse cycle.

[0003] However, there are numerous disadvantages associated with repeated use of conventional laundry treatment compositions and/or the actual laundry process; one of these being a fairly harsh treatment of fabric in the laundry process.

[0004] Fabrics can be damaged in several ways as a result of repeated laundering and/or wear. Fabric pilling and loss of fabric surface appearance e.g. fuzzing, shrinkage (or expansion), loss of colour from the fabric or running of colour on the fabric (usually termed dye transfer) are some of the common problems associated with repeated laundering. These problems may occur merely from repeated hand washing as well as the more vigorous machine washing process. Furthermore, problems relating to damage of fabric over time through normal use, such as loss of shape and increased likelihood of wrinkling are also significant.

[0005] The present invention is directed towards alleviating one or more of these problems.

[0006] The principal advantage of the present invention relates to improving the surface colour definition of a fabric after multiple washing and/or to imparting pill and/or fuzz resistance to fabric during laundering. The invention can have further advantages in the treatment of fabric. For example, other aspects of the overall appearance of the fabric can be improved, such as a reduction in the tendency of the fabric to become creased and/or wrinkled.

[0007] Laundry detergent compositions containing polyamide-polyamine fabric treatment agents are described in WO 98/29530. The compositions are claimed to impart improved overall appearance to fabrics laundered using the detergent compositions, in terms of surface appearance properties such as pill/fuzz reduction and anti-fading. Laundry compositions containing polyamide-polyamine treatment agents of similar types are taught in WO 97/42287.

[0008] Laundry compositions containing polyamide-polyamine fabric treatment agents can exhibit increased dye pick-up (i.e., increased dye transfer) and poor stain removal properties compared to other conventional laundry compositions.

[0009] Certain amphoteric polyurethane polymers are known to be useful as lubricating agents in the industrial treatment of fabric. An example of such a polymer composition is the product sold under the trade mark Arristan PMD by CHT, Germany. Methods for preparing amphoteric polymers of this type are known and are described in, for example, US 3997490.

[0010] It is well known that woollen goods are prone to shrinkage and several industrial treatments are known which can reduce the tendency of woollen goods to shrink. These processes are often intended to be applied to whole cloth rather than to finished garments. For various reasons many of these processes are not suitable for, or intended for, home use, being restricted in their application to one-off treatment of the goods or fabric.

[0011] GB 1547958 (IWS Nominee Company) explains how wool can be made shrink resistant by a chemical oxidative treatment such as chlorination. Such chemical processing reduces washability, so IWS proposes treatment of keratinaceous fibres with amphoteric cross-linking polymers. GB 159272 (IWS Nominee Company) further describes suitable polymers. Each of the processes which are described in these patents is essentially a one-off industrial process, where the polymer needs to be exhausted from solution onto the woollen substrate and such exhaustion either requires the use of exhaustion agents or acidic pH. Such methods of exhausting the treatment agent onto the fabric are not suitable for domestic washing processes and in general the process is not suitable for repeat usage on finished goods.

Definition of the Invention

[0012] The present invention is based on the surprising finding that certain amphoteric polymers can impart improved surface appearance to cellulosic fabrics. The polymers can have the further advantage of reduced adverse side-effects, in terms of increased dye transfer and poor stain removal, for example, compared to certain compositions containing polyamide-polyamine fabric treatment agents. Conveniently, the polymers can be applied repeatedly in a normal domestic laundry operation without the need for exhaustion agents or acidic pH's.

[0013] According to the present invention, there is provided a fabric care composition comprising one or more textile compatible and substantive carriers and an amphoteric polymer which is capable of self cross-linking and/or of reacting with cellulose wherein the polymer has a polymer backbone comprising at least one polyurethane-urea-polyamine or polyurethane-urea-polyamide chain.

[0014] The invention also provides a method of treating fabric, as part of a laundering process, which comprises applying to the fabric an amphoteric polymer which is capable of self cross-linking and/or of reacting with cellulose,

wherein the polymer has a polymer backbone comprising at least one polyurethane-urea-polyamine or polyurethane-urea-polyamide chain in a textile compatible and substantive carrier.

[0015] Further provided by the invention is the use of an amphoteric polymer which is capable of self cross-linking and/or of reacting with cellulose to improve the surface colour definition of a fabric after multiple washing wherein the polymer has a polymer backbone comprising at least one polyurethane-urea-polyamine or polyurethane-urea-polyamide chain.

[0016] In another aspect, the invention provides the use of an amphoteric polymer, which is capable of self cross-linking and/or of reacting with cellulose to impart pill and/or fuzz resistance to fabric during laundering, wherein the polymer has a polymer backbone comprising at least one polyurethane-urea-polyamine or polyurethane-urea-polyamide chain.

[0017] In yet another aspect, the invention provides the use of an amphoteric polymer, which is capable of self cross-linking and/or of reacting with cellulose to increase the degree of stain release from a stained fabric wherein the polymer has a polymer backbone comprising at least one polyurethane-urea-polyamine or polyurethane-urea-polyamide chain. In addition, the invention can impart other beneficial properties to the fabric, such as reduced creasing and/or wrinkling of the fabric during laundering.

Detailed Description of the Invention

[0018] The invention is based on the treatment of fabric with an amphoteric polymer, which is capable of self cross-linking and/or of reacting with cellulose in the presence of a suitable carrier wherein the polymer has a polymer backbone comprising at least one polyurethane-urea-polyamine or polyurethane-urea-polyamide chain. The carrier is both textile compatible and substantive to the textile.

[0019] In the context of the present invention the term "textile compatible carrier" is a component which can assist in the interaction of the amphoteric polymer with the fabric. The carrier can also provide benefits in addition to those provided by the amphoteric polymer e.g. softening, cleaning etc. The carrier may be, for example, a detergent-active compound or a fabric softener or conditioning compound or other suitable detergent or fabric treatment agent.

[0020] If the composition of the invention is to be used in a laundry process as part of a conventional fabric treatment product, such as a detergent composition, the textile-compatible carrier will typically be a detergent-active compound. Whereas, if the fabric treatment product is a rinse conditioner, the textile-compatible carrier will be a fabric softening and/or conditioning compound.

[0021] The compositions of the invention may be used at any stage of the laundering process. Preferably, the compositions are used to treat the fabric in the rinse cycle of a laundering process. The rinse cycle preferably follows the treatment of the fabric with a detergent composition.

[0022] If the composition of the invention is to be used before, or after, the laundry process it may be in the form of a spray or foaming product.

[0023] Carriers having a positive charge, including fabric softeners and/or conditioning agents are particularly preferred as these carries promote the deposition of the polymer at the fabric surface.

[0024] The most preferred embodiments of the invention are those where the composition comprises a fabric softening or conditioning composition which itself comprises a quaternary nitrogen group. It is believed that these materials can function as a carrier by forming a complex with the amphoteric polymer.

[0025] The fabrics that may be treated include those which comprise cellulosic fibres, preferably from 1% to 100% cellulosic fibres (more preferably 5% to 100% cellulosic fibres, most preferably 40% to 100%). The fabric may be in the form of a garment, in which case the method of the invention may represent a method of laundering a garment. When the fabric contains less than 100% cellulosic fibres, the balance comprises other fibres or blends of fibres suitable for use in garments such as polyester, for example. Preferably, the cellulosic fibres are of cotton or regenerated cellulose such as viscose.

[0026] The laundering processes of the present invention include the large scale and small scale (e.g. domestic) cleaning of fabrics. Preferably, the processes are domestic.

Polymers:

[0027] The polymer is amphoteric and therefore comprises both cationic and anionic groups.

[0028] The amphoteric polymer preferably comprises numbers of cationic and anionic groups such that the overall charge provided by the cationic and anionic groups is zero or substantially zero. However, the term "amphoteric" as used herein also covers cases in which the polymer comprises both cationic and anionic groups but a slight molar excess (e.g., a 10% molar excess) of one of these groups over the other which causes the polymer to be slightly positively or negatively charged.

[0029] The cationic groups are preferably obtainable by the reaction of an epihalohydrin (such as epichlorohydrin)

with amino groups in or on the polymer backbone. The amino groups may, for example, be secondary amino groups which are present in the polyamine which forms part of the polymer backbone. The cationic groups can be azetidinium groups of the following type:



[0030] In some embodiments, the polymer comprises two or more isocyanate end groups.

[0031] The polymer which is used in the invention is capable of self cross-linking and/or of reacting with cellulose. This ability to self cross-link and/or react with cellulose may be due to the isocyanate groups in the polymer. Additionally or alternatively, the ability to self cross-link and/or be reactive towards cellulose may be due to the presence of other reactive groups in the polymer, including the cationic and anionic groups in the polymer.

[0032] The polymer has a polymer backbone which comprises at least one polyurethane-urea-polyamine or polyurethane-urea-polyamide chain. The polymer may take any suitable form, including linear, branched or star shaped (but most preferably the polymer is linear). The polymer may contain chains other than the polyurethane-urea-polyamide or polyurethane-urea-polyamine chains, with these other chains being linked at the end of or within the polyurethane-urea-polyamide or polyurethane-urea-polyamine chains.

[0033] The anionic groups in the polymer are preferably bound to a nitrogen atom in the polymer backbone by an alkylene chain. The alkylene chain may be of the formula $(CRR')_n$, where R and R' are the same or different and are hydrogen or lower alkyl (including C_1 to C_3 unbranched or, for C_3, branched alkyl) and n is an integer from 2 to 20, preferably 2 to 10, more preferably 2 to 5 (such as 3). R and R' may be the same or different at different carbon atoms along the alkylene chain. Thus, formula $(CRR')_n$ covers, for example, not only groups such as $(CH_2)(CH_2)(CH_2)$ but also groups such as $(CH_2)(CH(CH_3))(CH_2)$. The anionic group is preferably monovalent. Suitable anionic groups include SO_3^- and CO_2^-.

[0034] The polymer contains urethane and amide and amine linkages which preferably repeat at least twice in the polymer chain. Polyoxyalkylene polymers may form a part of the polymer backbone, preferably linked into the polymer by urethane linkages at their ends e.g., by reaction of a polyoxyalkylene polymer with a di- or poly-isocyanate. Similarly, polyamine polymers may form a part of the polymer backbone, preferably linked into the polymer by urea linkages at their ends e.g., by reaction of the polyamine with a di- or poly-isocyanate.

[0035] The polymer may be produced by known methods. For example, the polymer may be formed according to the procedure set out in US 3997490, the contents of which are incorporated herein by reference. Thus, the polymer may be obtained by reaching an isocyanate-terminated urethane prepolymer, formed from a polyhydroxyl compound (such as a polyoxyalkylene polymer) and an excess of polyisocyanate (such as a diisocyanate), with an excess of a polyamine to form a polyurethane-urea-polyamine. The polyurethane-urea-polyamine thus formed is then reacted to introduce the charged (i.e., ionic) groups into the polymer. The polyurethane-urea-polyamine may be reacted with an epihalohydrin (such as epichlorohydrin) to introduce cationic groups into the polymer. The polyurethane-urea-polyamine may be reacted to introduce anionic groups into the polymer (before or after introduction of the cationic groups, preferably after introduction of the cationic groups), for example by reaction of the polyurethane-urea-polyamine (optionally containing cationic groups) with 1,3-propanesulphone, 1,4-butanesulphone, β-propiolactone, ε-caprolactone, δ-valerolactone or a sodium monohalocarboxylate of the formula $X(CH_2)_pCOONa$, wherein X is halogen and p is an integer from 1 to 5. Alternatively or additionally, anionic groups can be introduced into the polymer by reaction of the polyurethane-urea-polyamine (optionally containing cationic groups) with acrylonitrile or an acrylate or methacrylate ester and then hydrolysing the product to convert the ester groups to carboxylate groups.

[0036] The isocyanate groups which are preferably contained in the polymers are capable of reacting with water, although the rate of this hydrolysis reaction can be slow. Therefore, the compositions of the invention are preferably substantially anhydrous (e.g., by being in solid form or liquids containing non-aqueous solvents) or contain water in a relatively minor amount.

[0037] Any isocyanate groups in the polymer may be protected (e.g., by reaction with bisulphite), in order to reduce their susceptibility to hydrolysis. These protected isocyanate groups fall within the meaning of the term "isocyanate groups", as used herein.

[0038] The compositions of the invention have the surprising advantage of imparting wear resistance to fabrics, and thereby causing improved surface colour definition of the fabric after laundering, particularly after multiple washings. Furthermore, the polymeric materials contained in the compositions need not cause unacceptable dye transfer and/or

stain removal problems.

[0039] Suitable polymers for use in the invention are available in the form of polymer compositions sold under the trademark ARRISTAN PMD by CHT, Germany.

[0040] The amphoteric polymer is preferably present in the composition in a sufficient quantity to give an amount of 0.0005% to 5% by weight on the fabric based on the weight of the fabric, more preferably 0.001% to 2% by weight on fabric. The amount of the amphoteric polymer in the composition required to achieve the above % by weight on fabric will typically be in the range 0.01% to 35% by weight, preferably 0.1 to 13.5% by weight.

[0041] The compositions of the invention, when applied to a fabric, can impart benefits to the fabric when uncured. However, they may be cured by a domestic curing step including ironing and/or domestic tumble drying, preferably tumble drying. The curing is preferably carried out at a temperature in the range of from 50 to 100°C, more preferably from 80 to 100°C.

Carriers:

[0042] The nature of the textile compatible carrier present in the compositions of the invention is dictated to a large extent by the stage at which the composition of the invention is used in a laundering process. The compositions are capable of being used, in principle, at any stage of the process.

[0043] For example, where the compositions are for use as main wash detergent compositions, the one or more textile compatible carriers comprise a detergent active compound. Where the compositions are for use in the rinsing step of a laundering process, the one or more textile compatible carriers may comprise a fabric softening and/or conditioning compound. Use in the rinsing step is a preferred embodiment.

Detergent Active Compounds

[0044] If the composition of the present invention is in the form of a detergent composition, the textile-compatible carrier may be chosen from soap and non-soap anionic, cationic, nonionic, amphoteric and zwitterionic detergent active compounds, and mixtures thereof.

[0045] Many suitable detergent active compounds are available and are fully described in the literature, for example, in "Surface-Active Agents and Detergents", Volumes I and II, by Schwartz, Perry and Berch.

[0046] The preferred textile-compatible carriers that can be used are soaps and synthetic non-soap anionic and nonionic compounds.

[0047] Anionic surfactants are well-known to those skilled in the art. Examples include alkylbenzene sulphonates, particularly linear alkylbenzene sulphonates having an alkyl chain length of C_8-C_{15}; primary and secondary alkylsulphates, particularly C_8-C_{15} primary alkyl sulphates; alkyl ether sulphates; olefin sulphonates; alkyl xylene sulphonates; dialkyl sulphosuccinates; and fatty acid ester sulphonates. Sodium salts are generally preferred.

[0048] Nonionic surfactants that may be used include the primary and secondary alcohol ethoxylates, especially the C_8-C_{20} aliphatic alcohols ethoxylated with an average of from 1 to 20 moles of ethylene oxide per mole of alcohol, and more especially the C_{10}-C_{15} primary and secondary aliphatic alcohols ethoxylated with an average of from 1 to 10 moles of ethylene oxide per mole of alcohol. Non-ethoxylated nonionic surfactants include alkylpolyglycosides, glycerol monoethers, and polyhydroxyamides (glucamide).

[0049] Cationic surfactants that may be used include quaternary ammonium salts of the general formula $R_1R_2R_3R_4N^+ X^-$ wherein the R groups are independently hydrocarbyl chains of C_1-C_{22} length, typically alkyl, hydroxyalkyl or ethoxylated alkyl groups, and X is a solubilising cation (for example, compounds in which R_1 is a C_8-C_{22} alkyl group, preferably a C_8-C_{10} or C_{12}-C_{14} alkyl group, R_2 is a methyl group, and R_3 and R_4, which may be the same or different, are methyl or hydroxyethyl groups); and cationic esters (for example, choline esters) and pyridinium salts.

[0050] The total quantity of detergent surfactant in the composition is suitably from 0.1 to 60 wt% e.g. 0.5-55 wt%, such as 5-50wt%.

[0051] Preferably, the quantity of anionic surfactant (when present) is in the range of from 1 to 50% by weight of the total composition. More preferably, the quantity of anionic surfactant is in the range of from 3 to 35% by weight, e.g. 5 to 30% by weight.

[0052] Preferably, the quantity of nonionic surfactant when present is in the range of from 2 to 25% by weight, more preferably from 5 to 20% by weight.

[0053] Amphoteric surfactants may also be used, for example amine oxides or betaines.

[0054] The compositions may suitably contain from 10 to 70%, preferably from 15 to 70% by weight, of detergency builder. Preferably, the quantity of builder is in the range of from 15 to 50% by weight.

[0055] The detergent composition may contain as builder a crystalline aluminosilicate, preferably an alkali metal aluminosilicate, more preferably a sodium aluminosilicate.

[0056] The aluminosilicate may generally be incorporated in amounts of from 10 to 70% by weight (anhydrous basis),

preferably from 25 to 50%. Aluminosilicates are materials having the general formula:

$$0.8\text{-}1.5\ M_2O.\ Al_2O_3.\ 0.8\text{-}6\ SiO_2$$

where M is a monovalent cation, preferably sodium. These materials contain some bound water and are required to have a calcium ion exchange capacity of at least 50 mg CaO/g. The preferred sodium aluminosilicates contain 1.5-3.5 SiO_2 units in the formula above. They can be prepared readily by reaction between sodium silicate and sodium aluminate, as amply described in the literature.

Fabric Softening and/or Conditioner Compounds

[0057] If the composition of the present invention is in the form of a fabric conditioner composition, the textile-compatible carrier will be a fabric softening and/or conditioning compound (hereinafter referred to as "fabric softening compound"), which may be a cationic or nonionic compound.

[0058] These types of composition are a preferred embodiment of the invention.

[0059] The softening and/or conditioning compounds may be water insoluble quaternary ammonium compounds. The compounds may be present in amounts of up to 8% by weight (based on the total amount of the composition) in which case the compositions are considered dilute, or at levels from 8% to about 50% by weight, in which case the compositions are considered concentrates.

[0060] Compositions suitable for delivery during the rinse cycle may also be delivered to the fabric in the tumble dryer if used in a suitable form. Thus, another product form is a composition (for example, a paste) suitable for coating onto, and delivery from, a substrate e.g. a flexible sheet or sponge or a suitable dispenser during a tumble dryer cycle.

[0061] Suitable cationic fabric softening compounds are substantially water-insoluble quaternary ammonium materials comprising a single alkyl or alkenyl long chain having an average chain length greater than or equal to C_{20} or, more preferably, compounds comprising a polar head group and two alkyl or alkenyl chains having an average chain length greater than or equal to C_{14}. Preferably the fabric softening compounds have two long chain alkyl or alkenyl chains each having an average chain length greater than or equal to C_{16}. Most preferably at least 50% of the long chain alkyl or alkenyl groups have a chain length of C_{18} or above. It is preferred if the long chain alkyl or alkenyl groups of the fabric softening compound are predominantly linear.

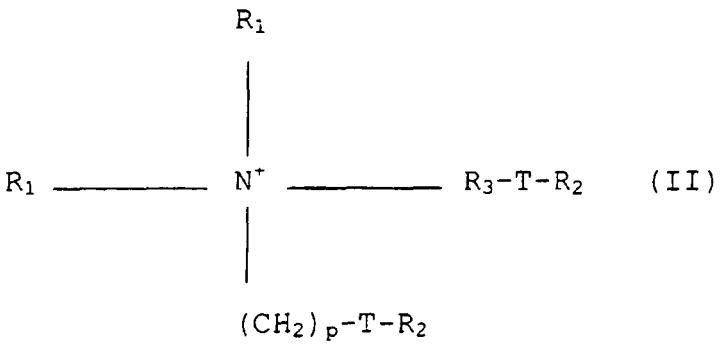
[0062] Quaternary ammonium compounds having two long-chain aliphatic groups, for example, distearyldimethyl ammonium chloride and di(hardened tallow alkyl) dimethyl ammonium chloride, are widely used in commercially available rinse conditioner compositions. Other examples of these cationic compounds are to be found in "Surface-Active Agents and Detergents", Volumes I and II, by Schwartz, Perry and Berch. Any of the conventional types of such compounds may be used in the compositions of the present invention.

[0063] The fabric softening compounds are preferably compounds that provide excellent softening, and are characterised by a chain melting Lβ to Lα transition temperature greater than 25°C, preferably greater than 35°C, most preferably greater than 45°C. This Lβ to Lα transition can be measured by DSC as defined in "Handbook of Lipid Bilayers", D Marsh, CRC Press, Boca Raton, Florida, 1990 (pages 137 and 337).

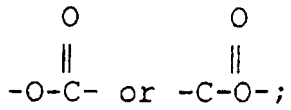
[0064] Substantially water-insoluble fabric softening compounds are defined as fabric softening compounds having a solubility of less than 1×10^{-3} wt % in demineralised water at 20°C.

[0065] Preferably the fabric softening compounds have a solubility of less than 1×10^{-4} wt%, more preferably less than 1×10^{-8} to 1×10^{-6} wt%.

[0066] Especially preferred are cationic fabric softening compounds that are water-insoluble quaternary ammonium materials having two $C_{12\text{-}22}$ alkyl or alkenyl groups connected to the molecule via at least one ester link, preferably two ester links. An especially preferred ester-linked quaternary ammonium material can be represented by the formula II:



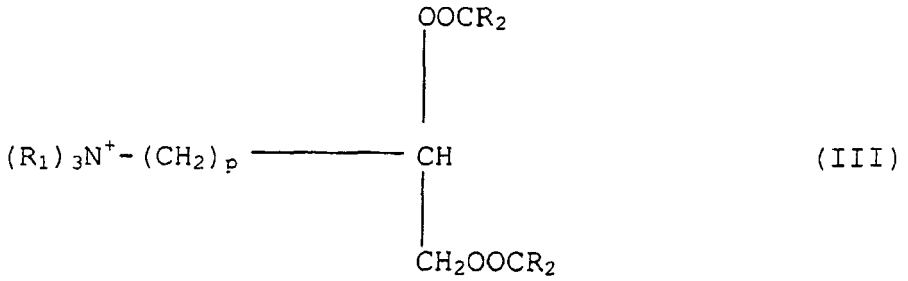
wherein each R_1 group is independently selected from C_{1-4} alkyl or hydroxyalkyl groups or C_{2-4} alkenyl groups; each R_2 group is independently selected from C_{8-28} alkyl or alkenyl groups; and wherein R_3 is a linear or branched alkylene group of 1 to 5 carbon atoms, T is



and *p* is 0 or is an integer from 1 to 5.

[0067] Di(tallowoxyloxyethyl) dimethyl ammonium chloride and/or its hardened tallow analogue is especially preferred of the compounds of formula (II).

[0068] A second preferred type of quaternary ammonium material can be represented by the formula (III):



(III)

wherein R_1, *p* and R_2 are as defined above.

[0069] It is advantageous if the quaternary ammonium material is biologically biodegradable.

[0070] Preferred materials of this class such as 1,2-bis(hardened tallowoyloxy)-3-trimethylammonium propane chloride and their methods of preparation are, for example, described in US 4 137 180 (Lever Brothers Co). Preferably these materials comprise small amounts of the corresponding monoester as described in US 4 137 180, for example, 1-hardened tallowoyloxy-2-hydroxy-3-trimethylammonium propane chloride.

[0071] Other useful cationic softening agents are alkyl pyridinium salts and substituted imidazoline species. Also useful are primary, secondary and tertiary amines and the condensation products of fatty acids with alkylpolyamines.

[0072] The compositions may alternatively or additionally contain water-soluble cationic fabric softeners, as described in GB 2 039 556B (Unilever).

[0073] The compositions may comprise a cationic fabric softening compound and an oil, for example as disclosed in EP-A-0829531.

[0074] The compositions may alternatively or additionally contain nonionic fabric softening agents such as lanolin and derivatives thereof.

[0075] Lecithins are also suitable softening compounds.

[0076] Nonionic softeners include Lβ phase forming sugar esters (as described in M Hato et al Langmuir 12, 1659, 1666, (1996)) and related materials such as glycerol monostearate or sorbitan esters. Often these materials are used in conjunction with cationic materials to assist deposition (see, for example, GB 2 202 244). Silicones are used in a similar way as a co-softener with a cationic softener in rinse treatments (see, for example, GB 1 549 180).

[0077] The compositions may also suitably contain a nonionic stabilising agent. Suitable nonionic stabilising agents are linear C_8 to C_{22} alcohols alkoxylated with 10 to 20 moles of alkylene oxide, C_{10} to C_{20} alcohols, or mixtures thereof.

[0078] Advantageously the nonionic stabilising agent is a linear C_8 to C_{22} alcohol alkoxylated with 10 to 20 moles of alkylene oxide. Preferably, the level of nonionic stabiliser is within the range from 0.1 to 10% by weight, more preferably from 0.5 to 5% by weight, most preferably from 1 to 4% by weight. The mole ratio of the quaternary ammonium compound and/or other cationic softening agent to the nonionic stabilising agent is suitably within the range from 40:1 to about 1:1, preferably within the range from 18:1 to about 3:1.

[0079] The composition can also contain fatty acids, for example C_8 to C_{24} alkyl or alkenyl monocarboxylic acids or polymers thereof. Preferably saturated fatty acids are used, in particular, hardened tallow C_{16} to C_{18} fatty acids. Preferably the fatty acid is non-saponified, more preferably the fatty acid is free, for example oleic acid, lauric acid or tallow fatty acid. The level of fatty acid material is preferably more than 0.1% by weight, more preferably more than 0.2% by weight. Concentrated compositions may comprise from 0.5 to 20% by weight of fatty acid, more preferably 1% to 10% by weight.

The weight ratio of quaternary ammonium material or other cationic softening agent to fatty acid material is preferably from 10:1 to 1:10.

[0080] The fabric conditioning compositions may include silicones, such as predominately linear polydialkylsiloxanes, e.g. polydimethylsiloxanes or aminosilicones containing amine-functionalised side chains; soil release polymers such as block copolymers of polyethylene oxide and terephthalate; amphoteric surfactants; smectite type inorganic clays; zwitterionic quaternary ammonium compounds; and nonionic surfactants.

[0081] The fabric conditioning compositions may also include an agent which produces a pearlescent appearance, e.g. an organic pearlising compound such as ethylene glycol distearate, or inorganic pearlising pigments such as microfine mica or titanium dioxide (TiO_2) coated mica.

[0082] The fabric conditioning compositions may be in the form of emulsions or emulsion precursors thereof.

[0083] Other optional ingredients include emulsifiers, electrolytes (for example, sodium chloride or calcium chloride) preferably in the range from 0.01 to 5% by weight, pH buffering agents, and perfumes (preferably from 0.1 to 5% by weight).

[0084] The compositions of the invention preferably comprise a perfume, such as of the type which is conventionally used in fabric care compositions. The compositions may be packaged and labelled for use in a domestic laundering process.

[0085] Further optional ingredients include non-aqueous solvents, perfume carriers, fluorescers, colourants, hydrotropes, antifoaming agents, antiredeposition agents, enzymes, optical brightening agents, opacifiers, dye transfer inhibitors, anti-shrinking agents, anti-wrinkle agents, anti-spotting agents, germicides, fungicides, anti-oxidants, UV absorbers (sunscreens), heavy metal sequestrants, chlorine scavengers, dye fixatives, anti-corrosion agents, drape imparting agents, antistatic agents and ironing aids. This list is not intended to be exhaustive.

Fabric Treatment Products

[0086] The composition of the invention may be in the form of a liquid, solid (e.g. powder or tablet), a gel or paste, spray, stick or a foam or mousse. Examples including a soaking product, a rinse treatment (e.g. conditioner or finisher) or a mainwash product. The composition may also be applied to a substrate e.g. a flexible sheet or used in a dispenser which can be used in the wash cycle, rinse cycle or during the dryer cycle.

[0087] The invention will now be described by way of example only and with reference to the following non-limiting examples.

EXAMPLES

[0088] The amphoteric polyurethane polymer used in the examples was ARRISTAN PMD™ (containing 28.8% by weight of the polyurethane polymer), available from CHT, Germany.

[0089] All percentages given in the examples are percentages by weight, unless otherwise stated.

Examples 1 and 2

[0090] Two products were made by mixing the following compounds:

Example 1: 52.0% Comfort (trade mark, Lever Brothers, UK) concentrated fabric conditioner
26.8% Arristan PMD™
21.2% Water
and

Example 2: 34.5% Comfort (trade mark, Lever Brothers, UK) concentrated fabric conditioner
34.7% Arristan PMD™
30.8% Water

[0091] Example 1 was formulated to deliver (theoretically) 0.1% fabric conditioner actives and 0.1% PMD actives and Example 2 was formulated to deliver 0.1% fabric conditioner actives and 0.2% PMD actives.

Example 3

Garment Care

[0092] The compositions of Examples 1 and 2, Comfort™ fabric conditioner and Example 3 (Arristan PMD™ composition alone) were each applied during the rinse cycle to a load of 600g white cotton sheeting and 130g of printed woven cotton

washed using 30g Persil Original Non-bio (trade mark) in a Zanussi Jetsystem 1200 (trade mark) washing machine, 40°C cotton wash program. Examples 1 and 2 were dosed to deliver 0.2% total actives (Example 1) and 0.3% total actives (Example 2) i.e., identical levels of fabric conditioner with varying levels of Arristan PMD™. Arristan PMD™ was applied alone at 0.2% actives and Comfort™ fabric conditioner was used at the same level. This was repeated five times for each treatment.

[0093] The colour change on the print was then measured using a Spectroflash™ spectrophotometer. The results are as follows:

Black printed area:

[0094]

	ΔL
Untreated	9.17
Comfort™ fabric conditioner	10.11
Example 1	6.83
Example 2	6.49
Example 3	7.11
ΔL=change in lightness	

[0095] The amphoteric polyurethane reduced the fading of the print, indicating that a higher level of the polymer is being delivered to the fabric when used in conjunction with the fabric conditioner.

Example 4

Soil Release/Redeposition

[0096] 1ml of red wine was applied to the fabrics treated as described in the preceding example and left for 7 days. Prior to washing, the colour of the wine stain and the background of the fabric was measured on a Spectroflash™ spectrophotometer. The samples were then washed at 40°C using 110g of Persil Performance Biological™ powder. After tumble-drying, the samples were conditioned and then remeasured. The results obtained were:

[0097] Red wine prior to washing:

	ΔL	ΔE
Untreated	-17.93	22.10
Comfort™ fabric conditioner	-22.12	26.26
Example 1	-23.83	28.36
Example 2	-22.64	26.99
Example 3	-18.44	22.90
ΔE=change in colour		

[0098] After washing, the colour measurements were:

	ΔL	ΔE
Untreated	-3.97	5.94
Comfort™ fabric conditioner	-3.78	5.39
Example 1	-3.63	5.21
Example 2	-3.32	4.83
Example 3	-3.18	4.71

[0099] In all cases, the fabrics display almost identical stain release properties to normal rinse conditioner. It also appears that including the amphoteric polyurethane actually improves the degree of stain release, possibly by creating

a soil-repellent weak anionic layer on the surface of the fabric.

[0100] The background of the fabric was compared to pre-wash measurements to evaluate the soil redeposition properties of the treatment. The Spectroflash™ results were:

	ΔL
Untreated	-0.20
Comfort™ fabric conditioner	-0.05
Example 1	-0.19
Example 2	-0.03
Example 3	0.05

[0101] Therefore, there is no evidence of increased soil redeposition by adding the polymer.

Claims

1. Fabric-care composition comprising one or more textile compatible and substantive carriers and an amphoteric polymer capable of self cross-linking and/or of reacting with cellulose, wherein the polymer has a polymer backbone comprising at least one polyurethane-urea-polyamine or polyurethane-urea-polyamide chain.

2. Composition as claimed in Claim 1, wherein the polymer comprises two or more isocyanate end groups.

3. Composition as claimed in claim 1 or claim 2, wherein the polymer comprises cationic groups obtainable by the reaction of an epihalohydrin with amino groups in or on the polymer backbone.

4. Composition as claimed in any one of Claims 1 to 3, wherein the polymer comprises anionic groups bound to a nitrogen atom in the polymer backbone by an alkylene chain.

5. Composition as claimed in Claim 4, wherein the anionic groups are $-SO_3^-$ groups.

6. Composition as claimed in any one of Claims 1 to 5, which further comprises a perfume.

7. Composition as claimed in any one of Claims 1 to 6, wherein the one or more textile compatible carriers comprise a detergent active compound.

8. Composition as claimed in any one of Claims 1 to 7, wherein the one or more textile compatible carriers comprise a fabric softening and/or conditioning compound.

9. Composition as claimed in Claim 8, wherein the fabric softening and/or conditioning compound comprises a quaternary ammonium group.

10. A method of treating fabric, as part of a laundering process, which comprises applying to the fabric an amphoteric polymer which is capable of self cross-linking and/or of reacting with cellulose, wherein the polymer has a polymer backbone comprising at least one polyurethane-urea-polyamine or polyurethane-urea-polyamide chain.

11. A method as claimed in Claim 10, wherein the polymer is applied to the fabric in the form of a composition according to any one of Claims 1 to 9.

12. A method as claimed in Claim 10 or Claim 11, wherein the composition is applied to the fabric during washing of the fabric.

13. A method as claimed in Claim 10 or Claim 11, wherein the composition is applied to the fabric during rinsing of the fabric.

14. Use of an amphoteric polymer capable of self cross-linking and/or of reacting with cellulose to improve the surface colour definition of fabric after multiple washings, wherein the polymer has a polymer backbone comprising at least

one polyurethane-urea-polyamine or polyurethane-urea-polyamide chain.

15. Use of an amphoteric polymer capable of self cross-linking and/or of reacting with cellulose to impart pill and/or fuzz resistance to fabric during laundering, wherein the polymer has a polymer backbone comprising at least one polyurethane-urea-polyamine or polyurethane-urea-polyamide chain.

16. Use of an amphoteric polymer capable of self cross-linking and/or of reacting with cellulose to increase the degree of stain release from a stained fabric, wherein the polymer has a polymer backbone comprising at least one polyurethane-urea-polyamine or polyurethane-urea-polyamide chain.

17. Use as claimed in any one of Claims 14 to 16, wherein the polymer comprises two or more isocyanate end groups.

18. Use as claimed in any one of Claims 14 to 17, wherein the polymer is in the form of a composition according to any one of Claims 1 to 9.

19. Use as claimed in any one of Clams 14 to 18, wherein the fabric comprises cellulosic fibres.

Patentansprüche

1. Textilpflegezusammensetzung, umfassend einen oder mehrere gewebekompatible und -substantive Träger und ein amphoteres Polymer, das zur Selbstvernetzung und/oder zur Reaktion mit Cellulose fähig ist, wobei das Polymer eine Polymerhauptkette aufweist, umfassend wenigstens eine Polyurethan-Harnstoff-Polyamin- oder Polyurethan-Harnstoff-Polyamid-Kette.

2. Zusammensetzung nach Anspruch 1, wobei das Polymer zwei oder mehr Isocyanatendgruppen umfaßt.

3. Zusammensetzung nach Anspruch 1 oder Anspruch 2, wobei das Polymer kationische Gruppen umfaßt, die durch die Umsetzung eines Epihalogenhydrins mit Aminogruppen in oder an der Polymerhauptkette erhältlich sind.

4. Zusammensetzung nach einem der Ansprüche 1 bis 3, wobei das Polymer anionische Gruppen umfaßt, die in der Polymerhauptkette durch eine Alkylenkette an ein Stickstoffatom gebunden sind.

5. Zusammensetzung nach Anspruch 4, wobei die anionischen Gruppen -SO3-Gruppen sind.

6. Zusammensetzung nach einem der Ansprüche 1 bis 5, die ferner einen Duftstoff umfaßt.

7. Zusammensetzung nach einem der Ansprüche 1 bis 6, wobei der eine oder die mehreren gewebekompatible(n) Träger eine reinigungsaktive Verbindung umfaßt/umfassen.

8. Zusammensetzung nach einem der Ansprüche 1 bis 7, wobei der eine oder die mehreren gewebekompatible(n) Träger eine textilerweichende und/oder -konditionierende Verbindung umfaßt/umfassen.

9. Zusammensetzung nach Anspruch 8, wobei die textilerweichende und/oderkonditionierende Verbindung eine quartäre Ammoniumgruppe umfaßt.

10. Verfahren zur Behandlung einer Textilie, als ein Teil eines Waschverfahrens, das die Auftragung eines amphoteren Polymers auf die Textilie umfaßt, das zur Selbstvernetzung und/oder zur Reaktion mit Cellulose fähig ist, wobei das Polymer eine Polymerhauptkette aufweist, umfassend wenigstens eine Polyurethan-Harnstoff-Polyamin- oder Polyurethan-Harnstoff-Polyamid-Kette.

11. Verfahren nach Anspruch 10, wobei das Polymer in Form einer Zusammensetzung nach einem der Ansprüche 1 bis 9 auf die Textilie aufgetragen wird.

12. Verfahren nach Anspruch 10 oder Anspruch 11, wobei die Zusammensetzung während der Wäsche der Textilie auf die Textilie aufgetragen wird.

13. Verfahren nach Anspruch 10 oder Anspruch 11, wobei die Zusammensetzung während des Spülens der Textilie

auf die Textilie aufgetragen wird.

14. Verwendung eines amphoteren Polymers, das zur Selbstvernetzung und/oder zur Reaktion mit Cellulose fähig ist, um die Oberflächenfarbdefinition der Textilie nach mehrfachen Wäschen zu verbessern, wobei das Polymer eine Polymerhauptkette aufweist, umfassend wenigstens eine Polyurethan-Harnstoff-Polyamin- oder Polyurethan-Harnstoff-Polyamid-Kette.

15. Verwendung eines amphoteren Polymers, das zur Selbstvernetzung und/oder zur Reaktion mit Cellulose fähig ist, um der Textilie während der Wäsche Pill- und/oder Zerfaserbeständigkeit zu verleihen, wobei das Polymer eine Polymerhauptkette aufweist, umfassend wenigstens eine Polyurethan-Harnstoff-Polyamin- oder Polyurethan-Harnstoff-Polyamid-Kette.

16. Verwendung eines amphoteren Polymers, das zur Selbstvernetzung und/oder zur Reaktion mit Cellulose fähig ist, um den Fleckenablösegrad aus einer befleckten Textilie zu erhöhen, wobei das Polymer eine Polymerhauptkette aufweist, umfassend wenigstens eine Polyurethan-Harnstoff-Polyamin- oder Polyurethan-Harnstoff-Polyamid-Kette.

17. Verwendung nach einem der Ansprüche 14 bis 16, wobei das Polymer zwei oder mehr Isocyanatendgruppen umfaßt.

18. Verwendung nach einem der Ansprüche 14 bis 17, wobei das Polymer in Form einer Zusammensetzung nach einem der Ansprüche 1 bis 9 vorliegt.

19. Verwendung nach einem der Ansprüche 14 bis 18, wobei die Textilie Cellulosefasern umfaßt.

Revendications

1. Composition d'entretien des tissus comprenant un ou plusieurs matériaux formant support compatibles avec les tissus et substantifs, ainsi qu'un polymère amphotère capable de s'auto-réticuler et/ou de réagir avec la cellulose, dans laquelle le polymère a un squelette polymère comprenant au moins une chaîne polyuréthane-urée-polyamine ou polyuréthane-urée-polyamide.

2. Composition selon la Revendication 1, dans laquelle le polymère comprend deux groupes terminaux isocyanates ou plus.

3. Composition selon la Revendication 1 ou la Revendication 2, dans laquelle le polymère comprend des groupes cationiques pouvant être obtenus par la réaction d'un épihalohydrine avec des groupes aminés dans ou sur le squelette polymère.

4. Composition selon l'une quelconque des Revendications 1 à 3, dans laquelle le polymère comprend des groupes anioniques liés à un atome d'azote dans le squelette polymère par une chaîne alkylène.

5. Composition selon la Revendication 4, dans laquelle les groupes anioniques sont des groupes $-SO_3^-$.

6. Composition selon l'une quelconque des Revendication 1 à 5, qui comprend en outre un parfum.

7. Composition selon l'une quelconque des revendications 1 à 6, dans laquelle le ou les matériaux formant support compatibles avec les tissus comprennent un composé détergent actif.

8. Composition selon l'une quelconque des Revendications 1 à 7, dans laquelle le ou les matériaux formant support compatibles avec les tissus comprennent un composé adoucissant pour les tissus et/ou de conditionnement.

9. Composition selon la Revendication 8, dans laquelle le composé adoucissant pour les tissus et/ou de conditionnement comprend un groupe ammonium quaternaire.

10. Procédé de traitement des tissus, faisant partie d'un procédé de lavage, qui comprend le fait d'appliquer sur le tissu un polymère amphotère qui est capable de s'auto-réticuler et/ou de réagir avec la cellulose, dans laquelle le polymère a un squelette polymère comprenant au moins une chaîne polyuréthane-urée-polyamine ou polyuréthane-urée-

polyamide.

11. Procédé selon la Revendication 10, dans lequel le polymère est appliqué sur le tissu sous la forme d'une composition selon l'une quelconque des Revendications 1 à 9.

12. Procédé selon la Revendication 10 ou la Revendication 11, dans lequel la composition est appliquée sur le tissu pendant le lavage du tissu.

13. Procédé selon la Revendication 10 ou la Revendication 11, dans lequel la composition est appliquée sur le tissu pendant le rinçage du tissu.

14. Utilisation d'un polymère amphotère capable de s'auto-réticuler et/ou de réagir avec la cellulose pour améliorer la définition de couleur de surface du tissu après de nombreux lavages, où le polymère a un squelette polymère comprenant au moins une chaîne polyuréthane-urée-polyamine ou polyuréthane-urée-polyamide.

15. Utilisation d'un polymère amphotère capable de s'auto-réticuler et/ou de réagir avec la cellulose pour conférer une résistance au boulochage et/ou au feutrage au tissu pendant le lavage où le polymère a un squelette polymère comprenant au moins une chaîne polyuréthane-urée-polyamine ou polyuréthane-urée-polyamide.

16. Utilisation d'un polymère amphotère capable de s'auto-réticuler et/ou de réagir avec la cellulose pour augmenter le niveau de décollement des salissures à partir d'un tissu tâché, où le polymère a un squelette polymère comprenant au moins une chaîne polyuréthane-urée-polyamine ou polyuréthane-urée-polyamide.

17. Utilisation selon l'une quelconque des Revendications 14 à 16, dans laquelle le polymère comprend deux groupes terminaux isocyanates ou plus.

18. Utilisation selon l'une quelconque des Revendications 14 à 17, dans laquelle le polymère est sous la forme d'une composition selon l'une quelconque des Revendications 1 à 9.

19. Utilisation selon l'une quelconque des Revendications 14 à 18, dans laquelle le tissu comprend des fibres cellulosiques.

REFERENCES CITED IN THE DESCRIPTION

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