SILOXANE-CONTAINING FORMULATION FOR REDUCING CREASE FORMATION

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Appl. No.: 11/993,923
PCT Filed: Jun. 24, 2006

ABSTRACT

Compositions comprising at least one aminoalkylsiloxane and at least one higher alkyl-modified amidoaminosiloxane modified by a compound having at least two hydroxyl groups selected from the group consisting of hydroxycarboxylic acids, monosaccharides, disaccharides and mixtures thereof are described along with fabric treatment agents containing such compositions, the use of such compositions and agents for treating fabrics, and containers with such compositions and/or agents.
SILOXANE-CONTAINING FORMULATION FOR REDUCING CREASE FORMATION

[0001] The present invention relates to a composition for reducing crease formation on textiles, which comprises a mixture of at least one aminoalkylsiloxane and at least one higher alkyl-modified amido aminosiloxane modified by hydroxyalkoxyacids and/or mono- and/or disaccharides having in each case at least two hydroxyl groups, and to the use of this composition for the treatment of textiles.

[0002] Greases and wrinkles in textiles are caused by folding and creasing the textiles as a result of the action of external forces, especially by wearing and by washing the textiles, wherein the outward facing part of the textile is strained and simultaneously the inward facing part of the textile is exposed to a pressure. At the molecular level this can especially lead to the formation of hydrogen bonds that following a decrease in the action of the force can at least partially stop the state of deformation. This problem arises principally with cotton and the hydrogen bonds that are present here between cellulose molecules.

[0003] In the prior art it has already been described that crease formation in textiles can be reduced by using polysiloxanes.

[0004] Thus, in U.S. Pat. No. 4,923,623, compositions are described for reducing crease formation in textiles, which involve a starch-containing liquid and comprise aminosilicone.

[0005] The applications WO 96/15309 and WO 96/15310 describe a composition for reducing the crease formation in textiles, which comprises effective amounts of a silicone and a film forming polymer as well as a liquid carrier, the composition being essentially free of starch and modified starch.

[0006] EP 0 058 493 describes compositions for treating textiles, based on combinations of specific polyorganosiloxanes, wherein inter alia the reduction of crease formation is also cited.


[0008] Surprisingly, it has now been found that a composition comprising at least one aminoalkylsiloxane and at least one higher alkyl-modified amido aminosiloxane modified by hydroxyalkoxyacids and/or mono- and/or disaccharides having in each case at least two hydroxyl groups, possesses particularly advantageous properties in regard to anti-wrinkle behavior.

[0009] Accordingly, a subject of the present invention is a composition comprising at least one aminoalkylsiloxane and at least one higher alkyl-modified amido aminosiloxane modified by hydroxyalkoxyacids and/or mono- and/or disaccharides having in each case at least two hydroxyl groups.

[0010] Both the aminoalkylsiloxane and the higher alkyl-modified amido aminoalkylsiloxane are preferably selected from substances of the general formula (I)

\[
R^1\left[\begin{array}{c}
\text{Si-O-Si-O-}\\R^2\end{array}\right]_{k}R^3
\]

in which, for the higher alkyl-modified amido aminosiloxane in Formula (I)

[0011] \( R^1 \) stands for the same or different, monoal, optionally fluoro-, chlorine- or bromine substituted \( C_1 \) to \( C_{18} \) hydrocarbon groups, hydrogen atoms, \( C_1 \) to \( C_{12} \) alkoxy- or hydroxyl groups or alkyl glycol groups,

[0012] \( R^2 \) stands for \( R^1 \) and/or a group \( X \) and/or \( Y \).

[0013] \( X \) stands for a group of the general formulae (II) and/or (III),

\[
-r^{\ast}N\varphi^{\ast}z^{\ast}
\]

(II)

\[
-r^{\ast}N\varphi^{\ast}CH_3,N\varphi^{\ast}z^{\ast}
\]

(III)

in which \( R^3 \) stands for a divergent \( C_1 \) to \( C_{18} \) hydrocarbon group.

[0014] \( R^4 \) stands for a hydrogen atom or an optionally fluoro-, chlorine- or bromine substituted \( C_1 \) to \( C_{10} \) alkyl group.

[0015] \( Z \) is derived from hydroxyalkoxyacids and oxidized mono- and disaccharides, each containing at least two hydroxyl groups.

[0016] \( R^5 \) stands for a hydrogen atom and/or \( Z \).

[0017] \( Y \) stands for a group of the general formulae (IV) and/or (V),

\[
-r^{\ast}N\varphi^{\ast}z^{\ast}
\]

(IV)

\[
-r^{\ast}N\varphi^{\ast}CH_3,N\varphi^{\ast}z^{\ast}
\]

(V)

in which \( R^2 \) and \( R^4 \) have the abovementioned meanings,

[0018] \( k \) is an average value from 0.5 to 50,

[0019] \( l \) is an average value from 10 to 1500,

[0020] \( m \) has an average value of 0 to 50 and

[0021] \( p \) stands for the values 2, 3 or 4,

[0022] with the proviso that the ratio of \( k \) to \( m \) resides in the range 10:1 to 0:1:1,

[0023] and wherein the aminoalkylsiloxane in formula (I)

[0024] \( R^1 \) stands for the same or different, monovalent, optionally fluoro-, chlorine- or bromine substituted \( C_1 \) to \( C_{18} \) hydrocarbon groups, hydrogen atoms, \( C_1 \) to \( C_{12} \) alkoxy- or hydroxyl groups or alkyl glycol groups.

[0025] \( R^2 \) stands for \( R^1 \) and/or for \( Y \).

[0026] \( Y \) stands for a group of the general formulae (IV) and/or (V),

\[
-r^{\ast}N\varphi^{\ast}z^{\ast}
\]

(IV)

\[
-r^{\ast}N\varphi^{\ast}CH_3,N\varphi^{\ast}z^{\ast}
\]

(V)

in which \( R^3 \) stands for a divergent \( C_1 \) to \( C_{18} \) hydrocarbon group.

[0027] \( R^4 \) stands for a hydrogen atom or an optionally fluoro-, chlorine- or bromine substituted \( C_1 \) to \( C_{10} \) alkyl group.

[0028] \( k \) has the value 0,

[0029] \( l \) is an average value from 10 to 1500,

[0030] \( m \) has an average value of 1 to 100, particularly 5 to 50, and \( p \) stands for the values 2, 3 or 4.

[0031] The sequential configuration of the substituted silicon atoms in the molecule is in any order and results from the production process.

[0032] Exemplary \( C_1 \)-\( C_{18} \)-hydrocarbon groups \( R^1 \) are methyl, ethyl, n-propyl, iso-propyl, n-butyl, iso-butyl, tert.-butyl, n-pentyl, neo-pentyl, tert.-pentyl, n-hexyl, n-heptyl, n-octyl, trimethylpentyl, \( n \)-nonyl, \( n \)-decal, \( n \)-undecyl, \( n \)-dodecyl, cycloalkyl, especially cyclopentyl or cyclohexyl, methylcyclohexyl, aryl, especially phenyl or naphthyl, alkaryl, especially \( o \)-, \( m \)- or \( p \)-tolyl, xylyl or ethylphenyl, aralkyl groups, especially benzyl, \( o \)- or \( \beta \)-phenyl ethyl. \]
The preceding hydrocarbon groups optionally comprise an aliphatic double bond. Exemplary alkyl groups are vinyl, allyl, 5-hexenyl, E-4-hexenyl, Z-4-hexen-1-yl, 2-(3-cyclohexenyl)methyl and cycloocta-4,8-dienyl. Preferred groups with an aliphatic double bond are vinyl, allyl and 5-hexenyl groups. Preferably however, a maximum of 1% of the hydrocarbon groups \( R^1 \) comprise a double bond.

Exemplary \( C_1 \) to \( C_{18} \)-hydrocarbon groups that are substituted with fluorine, chlorine or bromine atoms are the 3,3,3-trifluoro-\( n \)-propyl ester, the 2,2,2,2',2',2'-hexafluoroisopropyl group, the heptafluorosipropyl group and the \( o \)-, \( m \)- and \( p \)-chlorophenyl group.

Exemplary \( C_1 \) to \( C_{10} \)-alkyl groups \( R^4 \) are the previously listed examples for \( R^1 \) of linear and cyclic alkyl groups and the \( C_1 \) to \( C_{10} \)-alkyl groups substituted with fluorine, chlorine or bromine atoms.

Exemplary divalent \( C_1 \) to \( C_{18} \)-hydrocarbon groups \( R^2 \) are saturated linear or branched or cyclic alkyne groups such as the methylene and ethylene groups as well as propylene, butylene, pentylene, hexylene, 2-methylpropylene, cyclohexylene and octadecylene groups or unsaturated alkyne or arylene groups such as the hexyne group and phenylene group, the \( n \)-propylene group and the 2-methylpropylene group being particularly preferred. The alkoxy groups are the previously described alkylic groups bonded through an oxygen atom. The examples of the alkyl groups are also completely valid for the alkoxy groups.

The alkyl glycol groups \( R^1 \) preferably possess the general formula (VI)

\[
R^1 = \{\text{O} (\text{CH}R^m_{20})_{20} \}, \text{OR}^2
\]

in which \( R^2 \), \( R^4 \) have the preceding meaning, \( q \) has the value 1 to 100 and \( R^3 \) stands for a hydrogen atom, for a group \( R^1 \) or for a group of the general formula \( \text{C}(-\text{O})_{2} - \text{R}^3 \)

in which \( R^3 \) stands for the group \( \text{R}^4 \) or \( \text{O} - \text{R}^4 \).

Z stands for groups that derive from hydroxy carboxylic acids and oxidized mono- and disaccharides that contain at least two hydroxyl groups. Oxidized monosaccharides such as uronic, aldarc and aldonic acids of the general formula (VII), (VIII) and (IX) are preferred

\[
\begin{align*}
\text{O-CH-} & \text{[CH(OH)]}_{20} \text{-CO-} \quad (VII) \\
\text{HOOC-} & \text{[CH(OH)]}_{20} \text{-CO-} \quad (VIII) \\
\text{HOCH}_{2}-\text{[CH(OH)]}_{20} & \text{-CO-} \quad (IX)
\end{align*}
\]

with \( 2 \leq n \leq 10 \).

Exemplary Z groups include mevaloninic acid, galacturonic acid, glucuronic acid, L-iduronic acid, galactaric acid, glucaric acid, gluconic acid, mannonic acid, 2-keto-L-gulonic acid groups and groups that are derived from the formula

\[
\begin{align*}
\text{C} & \text{-O} \\
\text{OH} & \text{COH} \\
\text{OH} & \text{COH} \\
\text{OH} & \text{CH}_{2}
\end{align*}
\]

In the context of the present invention, room temperature solid lactones are particularly preferably employed.

Preferably, in the preceding general formulae (I) to (VI), independently of each other.

\( R^1 \) stands for a methyl-, phenyl-, \( C_1 \)-\( C_3 \)-alkoxy- or hydroxyl group or a group of the general formula (VI),

\( R^2 \) stands for a group \( R^1 \),

\( R^3 \) stands for a divalent \( C_1 \) to \( C_{10} \)-hydrocarbon group,

\( R^4 \) stands for a hydrogen atom or a \( C_1 \) to \( C_{10} \)-alkyl group.

Preferably, in the alkyl-modified amido aminosiloxane

\( k \) stands for a value from 0.5 to 10,

\( l \) stands for a value from 40 to 600,

\( m \) stands for a value from 0 to 10 and

\( p \) stands for the value 2.

Here, those amido-functional aminopolysiloxanes are particularly preferred, in which the ratio of \( k \) to \( m \) is in the range 5:1 to 1:1.

In a particularly preferred embodiment of the higher alkyl-modified amido aminosiloxanes,

\( R^1 \) stands for methyl,

\( R^2 \) stands for \( C_1 \)-\( C_4 \)-alkyl, especially methyl, OH, or \( C_1 \)-alkoxy, especially methoxy,

\( X \) stands for a reaction product of aminomethylaminopropyl with gluconic acid lactone,

\( Y \) stands for aminoethylaminopropyl.

In a particularly preferred embodiment of the aminosiloxanes

\( R^1 \) stands for methyl,

\( R^2 \) stands for \( C_1 \)-\( C_4 \)-alkyl, especially methyl, OH, or \( C_1 \)-alkoxy, especially methoxy,

\( Y \) stands for aminoethylaminopropyl.

Preferably, the aminosiloxane and the higher alkyl-modified amido aminosiloxane, independently of one another, are comprised in the inventive composition in a quantity of 0.001-20 wt. %, particularly preferably in a quantity of 0.01-10 wt. %, above all in a quantity of 0.1-5.0 wt. %.

The weight ratio of the active substances is preferably between 1:20 and 20:1, particularly 1:10 and 10:1, preferably 2:3 to 3:2.

In a particularly preferred embodiment, the weight ratio of higher alkyl-modified amido aminosiloxane to aminosiloxane is between 1:1 and 1:2, preferably between 1:1.3 and 1:1.7, preferably between 1:1.4 and 1:1.6, above all at about 1:1.5, wherein the total amount of active substance is between 0.1 and 3.0 wt. %, particularly between 0.15 and 2.0 wt. %, preferably between 0.2 and 1.0 wt. %.

In a quite particularly preferred embodiment, a quantity of
active substances between 0.3 and 0.5 wt. % is also even sufficient to provide a significant improvement with respect to the prior art.

A further subject of the present invention is the use of an inventive composition for removing and/or reducing creases and/or the formation of creases and/or for preventing the formation of creases in textiles.

A further subject of the present invention is the use of an inventive composition for treating textiles, in particular as a smooth finishing, ironing auxiliary or rinse softener as well as the use of an inventive composition in a textile treatment agent, in particular in a smooth finisher, in an ironing auxiliary or in a rinse softener.

A further subject of the present invention is a textile treatment agent comprising an inventive composition, wherein the textile treatment agent especially concerns a smooth finisher, an ironing auxiliary or a rinse softener.

Textiles made of wool, cotton, silk, angora, synthetic silk, polyester, polyamide, polyacryls as well as mixed fabrics made of these materials may be cited as examples of inventively treatable textiles. The textiles are preferably made of wool or cotton as well as mixed fabrics that comprise wool or cotton.

The inventive composition or the inventive textile treatment agent can also comprise additional components, especially those that are commonly used for the cited textile treatment agents or end uses.

In an inventively preferred embodiment, the inventive composition comprises at least one component selected from non-aqueous solvents, perfumes and/or preservatives.

Non-aqueous solvents that can be employed originate for example from the group of mono- or polyhydric alcohols, alkanolamines or glycol ethers, in so far that they are miscible with water in the defined concentration range. Preferably, the solvents are selected from ethanol, n- or i-propanol, butanols, glycol, propane diol or butane diol, glycerine, diglycol, propyl diglycol or butyl diglycol, hexylene glycol, ethylene glycol methyl ether, ethylene glycol ethyl ether, ethylene glycol propyl ether, ethylene glycol mono-n-butyl ether, diethylene glycol methyl ether, ethylene glycol ethyl ether, propylene glycol methyl-, ethyl-, propyl ether, dipropylene glycol methyl-, or ethyl ether, disopropylene glycol methyl-, or ethyl ether, methoxy-, ethoxy- or butoxy triglycol, 1-butoxyethoxy-2-propanol, 3-methylethoxymyl-butanol, propylene glycol 1-butyl ether as well as mixtures of these solvents. Ethanol is particularly preferred.

Non-aqueous solvents, especially ethanol or isopropanol, are preferably comprised in the inventive composition in a quantity of 0.001-5 wt. %, particularly preferably in a quantity of 0.01-10 wt. %, above all in a quantity of 0.1-5 wt. %.

The known mixtures of natural and synthetic odoriferous substances can be cited as examples of perfumes. Natural aromas are extracts of flowers (lilies, lavender, roses, jasmine, neroli, ylang ylang), stalks and leaves (geranium, patchouli, petit grain), fruits (aniseed, coriander, wafer, juniper), fruit skins (bergamot, lemons, oranges), roots (mace, angelica, celery, cardamom, costic, iris, calamus), wood (pine, sandal, guava, cedric, rose wood), herbs and grasses (tarragon, lemon grass, sage, thyme), needles and twigs (spruce, fir, scotch pine, larch), resins and balsams (galbanum, elemi, benzoic, myrrh, olibanum, opoponax). In addition, materials of animal origin such as e.g. civet and castoreum can be considered. Typical synthetic odoriferous compounds are products of the type of the esters, ethers, aldehydes, ketones, alcohols and hydrocarbons. Perfume compounds of the ester type are, for example, benzy alcohol, phenoxyethyl isobutyrate, p-tert.-butylcyclohexyl acetate, linalyl acetate, dimethylbenzyl carbinyl acetate, phenyl ethyl acetate, linalyl benzoate, benzy formate, ethoxymethylphenyl glycinate, allyl cyclohexyl propionate, styryl propionate and benzy salicylate. The ethers include, for example, benzy ethyl ether, the aldehydes include, for example, the linear alkanols containing 8 to 18 carbon atoms, citral, citronellal, citronellyloxyacetalddehyde, cyclamen aldehyde, hydroxy-citronellal, lilial and bourgeon; the ketones include, for example, the ionones, a-isomethyl ionone and methyl cedryl ketone; the terepene alcohols include anethol, citronellol, eugenol, iso-eugenol, geraniol, linalool, nerol, phenylethyl alcohol, tetrahydromyrcenol and terpineol and the hydrocarbons include, above all, the terpenes and balsams. However, mixtures of various odoriferous substances, which together produce an attractive fragrant note, are preferably used. The ethereal oils of lower volatility that are mostly used as aroma components are suitable as perfume oils, e.g. oil of sage, chamomile oil, clove oil, melissa oil, mint oil, cinnamon leaf oil, lime blossom oil, juniper berry oil, vetiver oil, olibanum oil, galbanum oil, labdanum oil and lavender oil, Bergamot oil, dihydromyrcenol, lilial, lilial, citronelol, phenylethyl alcohol, a-hexylcinnamaldehyde, geraniol, benzy acetone, cyclamen aldehyde, linalool, boisbemurente forte, ambroxane, incole, hedione, sandelice, lemon oil, mandarin oil, orange oil, allyl amyl glycolate, cycrovertol, lavender oil, muscatel oil of sage, β-damascone, geranium oil bourbon, cyclohexyl salicylate, vertifex coeur, iso-l-supor, fixobile NP, evernly, iraldein gamma, phenylacetic acid, geranyl acetate, benzy acetate, rose oxide, romillat, irotyl and floramate, singly or in mixtures, are preferably employed.

Perfume materials are preferably comprised in the inventive composition in a quantity of 0.001-5 wt. %, particularly preferably in a quantity of 0.01-3 wt. %, above all in a quantity of 0.1-2 wt. %.

Suitable preservatives are especially isothiazoline mixtures, sodium benzoate and/or salicylic acid. Further examples are substances with specific action against gram-positive bacteria such as for example 2,4,4′-trichloro2-hydroxydiphenyl ether, chlorhexidine (1,6-dii-(4-chlorophenyl-biguandio)-hexane) or TCC (3,4,4′-trichlorokarbanilide). Numerous odoriferous substances also exhibit antimicrobial properties. Typical examples are the active substances eugenol, menthol and thymol in oil of cloves, mint oil and thymian oil. An interesting natural germ inhibitor is the terepene alcohol famesol (3,7,11-trimethyl-2,6,10-dodecatien-1-ol), which is found in lime tree blossom oil and has an odor of lily of the valley. Glycerine monolaurate has also proved to be a bacteriostat. The amount of these germ inhibitors strongly depends on the activity of the respective compound and can be up to 5 wt. %.

Further suitable preservatives are e.g. benzoic acid or benzoate, salicylic acid or salicylate, sorbic acid or sorbate, formic acid or formate, propionic acid or propionate, formaldehyde, guitaraldehyde, o-phenylphenol, PH3 esters (e.g. butyl 4-hydroxybenzoate, methyl 4-hydroxybenzoate, ethyl 4-hydroxybenzoate, propyl 4-hydroxybenzoate), 10-undecylenic acid, heptadite, bromoxon, bromonol, trichlorocarbonnilide, p-chloro-m-cresol, triclosan, imidazolidinyl urea, 2-phenoxethanol, dimethyl dimethylol hydantoin, benzy alcohol, dibromocyanobutane, isothiazolinone mixtures,
2-chloroacetamide, chlorhexidine gluconate, diazolidinyl urea, benzalkonium chloride, 1,2-benzisothiazolone, benzyl alcohol monochloroform, 2-(2-hydroxypropyl)aminomethanol, methylene bisthiocyanate, (thiocyanomethylthio)benzothiazole, diithio-2,2'-bis(benzylthalamide), silver chloride on TiO₂, carrier, diexidimethyleneammonium chloride, N,N-bis-3-aminopropyl-C12-amine, Na hydroxymethylglycinate, dehydroacetic acid, ethylene glycol diformal, 2,4-dichlorobenzyl alcohol, 2-phenoxycpropanol, 3-(4-chlorophenyl)-1,2-propanediol, 4-chloro-3,5-dimethylphenol, hexadecylpyridinium chloride and or 3-isopropylidimethylbutyl-carbamate.

[0077] Preservatives are preferably comprised in the inventive composition in a quantity of 0.0001-5 wt. %, particularly preferably in a quantity of 0.001-1 wt. %, above all in a quantity of 0.01-0.1 wt. %.

[0078] A further subject of the present invention is a container that comprises an inventive composition or an inventive textile treatment agent. In a preferred embodiment, this container contains a spray. Therefore, in a preferred embodiment, the container includes a spray dispenser, and the cleaning agent is preferably applied from the container by the use of this spray dispenser.

[0079] The preferred spray dispenser is a manually operated spray dispenser, selected in particular from the group including aerosol spray dispensers pressurized gas containers; also known inter alia as spray cans), self generated pressure spray dispensers, pump spray dispensers and trigger spray dispensers, particularly pump spray dispensers, and trigger spray dispensers with a container made of transparent polyethylene or polyethylene terephthalate. Spray dispensers are extensively described in WO 96/04940 (Proctor & Gamble) and in the US patents cited therein concerning spray dispensers, all of which are referred to in this respect and their content is hereby incorporated in this application. Trigger spray dispensers and pump spray dispensers are advantageous in comparison with pressurized gas containers as no propellant need be employed.

[0080] Consequently, particularly when pressurized gas containers are used, the inventive composition can also comprise one or a plurality of propellants. They are usually comprised in an amount of 1 to 60 wt. %, preferably 1.5 to 30 wt. %, particularly 2 to 10 wt. %, particularly preferably 2.5 to 8 wt. %, above all 3 to 6 wt. %.

[0081] Propellants, according to the invention, are usually propellant gases, particularly liquefied or compressed gases. The choice depends on the product to be sprayed and the field of application. When using compressed gases such as nitrogen, carbon dioxide or nitrous oxide, which are generally insoluble in the liquid cleaning agent, the operating pressure is reduced with each actuation of the valve. Liquefied gases that are soluble in, or that themselves act as solvents for the cleaning agent, offer the advantage as propellants of a constant operating pressure and uniform distribution, because the propellant evaporates in air and then expands several hundred times in volume.

[0082] Accordingly, the following are suitable propellants (names according to INCI): butane, carbon dioxide, dimethyl carbonate, dimethyl ether, ethane, dichlorofluorocarbon 22, dichlorodifluorocarbon 142b, dichlorofluorocarbon 152a, dichlorodifluoromethane 134a, dichloroefluorocarbon 227ea, isobutane, isopentane, nitrogen, nitrous oxide, pentane, propane. However, the use of chlorofluorocarbons (CFC) as propellants is preferably widely avoided and especially totally avoided due to their harmful effect on the ozone layer of the atmosphere that protects against harmful UV radiation.

[0083] Preferred propellants are liquid gases. Liquid gases are gases that can be transformed from the gaseous into the liquid state at mostly already low pressures and 20°C. However liquid gases are particularly understood to be the hydrocarbons propane, propene, butane, butene, isobutene (2-methylpropane), isobutene (2-methylpropene, isobutylene) and their mixtures, which occur as by-products from distilling and cracking oil in oil refineries as well as in natural gas processing in gasoline separation. The inventive composition particularly preferably comprises one or a plurality of propellants selected from propane, butane and/or isobutene, especially propane and butane, above all a mixture of propane, butane and isobutene.

[0084] In a further inventively preferred embodiment, the inventive composition concerns a fabric softener. It is usually introduced into the rinse cycle of an automatic washing machine.

[0085] In addition to the components cited above, the inventive composition, particularly as a fabric softener, can comprise one or a plurality of the components listed below.

[0086] In a preferred embodiment, the inventive composition additionally comprise softener components in order to improve the soft feel and the freshening properties. Examples of such compounds are quaternary ammonium compounds, cationic polymers and emulsifiers, as are incorporated in hair care agents and also in fabric fresheners.

[0087] Suitable examples are quaternary ammonium compounds of Formulae (XII) and (XIII).

$$R={\text{N}}^{+}R_1R_2\;{\text{X}}^{-}$$

$$R^1{\text{(CO)}}\longrightarrow{\text{O}}\longrightarrow{\text{(CH}_2)_m}{\text{N}}^{+}\longrightarrow{\text{R}_3}{\text{R}_4}$$

wherein in (XII) R and R₁ stand for an acyclic alkyl group containing 12 to 24 carbon atoms, R₂ stands for a saturated C-C₂ alkyl or hydroxyalkyl group, R₁ is either equal to R₂ or R₃ or R₄ or stands for an aromatic group, X stands either for a halide ion, methosulfate ion, methophosphate ion or phosphate ion as well as their mixtures. Exemplary cationic compounds of Formula (XIII) are didecyl dimethyl ammonium chloride, ditallow dimethyl ammonium chloride or dihexadecyl ammonium chloride.

[0088] Compositions are particularly preferred, which additionally possess fabric softening components based on esterquats.

[0089] Compounds of Formula (XIII) are so-called esterquats. Esterquats are characterized by their outstanding biodegradability. In Formula (XIII), R₄ stands for an aliphatic alkyl group containing 12 to 22 carbon atoms and 0, 1, 2, or 3 double bonds, R₅ stands for H, OH or O(CO)R₆, R₆ independently of R₃ stands for H, OH or O(CO)R₈, wherein R₇ and R₈, independently of each other, each stand for an aliphatic alkyl group having 12 to 22 carbon atoms with 0, 1, 2 or 3 double bonds, m, n and p independently of each other can
each have the value 1, 2 or 3. \( X^- \) can be either a halide ion, methosulfate ion, methophosphate ion or phosphate ion as well as their mixtures. Preferred compounds comprise a group \( O(CO)R^1 \) for \( R^1 \) and alkyl groups with 16 to 18 carbon atoms for \( R^2 \) and \( R^3 \). Particularly preferred are compounds in which \( R^3 \) stands moreover for OH. Examples of compounds of Formula (IV) are methyl-N-(2-hydroxyethyl)-N,N-di(talloweyxoleyl)ammonium methosulfate, bis(palmitoyl)-ethyl-hydroxyethyl-methyl-ammonium methosulfate or methyl-N,N-bis(oleoyxoleyl)-N-(2-hydroxyethyl)ammonium methosulfate. When quaternized compounds of Formula (IV) are used that have unsaturated alkyl chains, then acyl groups are preferred, whose corresponding fatty acids have an iodine number between 5 and 80, preferably between 10 and 60 and particularly between 15 and 45 and which have a cis/trans isomer ratio (in wt. %) of greater than 50:70, preferably greater than 50:50 and particularly greater than 70:30. Commercial examples are the methylhydroxyalkylidialkoxolylalkylammonium methosulfates marketed by Stepan under the trade name Stepanex® or known products from Cognis with the trade name Debyquat® or the known products manufactured by Goldschmidt-Witco under the trade name Rewoquat® name. Further preferred compounds are the diesters or Formula (XIV), which are available under the names Rewoquat® W 222 LM or CR 3099 and which assure stability and color protection in addition to softness.

\[
\text{(XIV)}
\]

\( R^{21} \) and \( R^{22} \) stand, independently of each other, each for an aliphatic group having 12 to 22 carbon atoms with 0, 1, 2 or 3 double bonds.

Furthermore, preferred quaternary compounds, other known compounds can also be employed, such as, for example quaternary imidazolium compounds of Formula (XV),

\[
\text{(XV)}
\]

wherein \( R^9 \) stands for a saturated alkyl group with 1 to 4 carbon atoms, \( R^{10} \) and \( R^{11} \), independently of one another, each stand for an aliphatic, saturated or unsaturated alkyl group with 12 to 18 carbon atoms, \( R^{10} \) can alternatively stand for \( O(CO)R^{20} \), wherein \( R^{20} \) means an aliphatic, saturated or unsaturated alkyl group with 12 to 18 carbon atoms, and \( Z \) means an NH group or oxygen and \( X^- \) is an anion. \( q \) can take values of integers between 1 and 4.

Further preferably preferred esterquats are described by the Formula (XVI),

\[
\text{(XVI)}
\]

wherein \( R^{12} \), \( R^{13} \) and \( R^{14} \) independently of one another stand for a \( C_{1-4} \) alkyl, alkynyl or hydroxalkyl group, \( R^{15} \) and \( R^{16} \), each independently selected, represents a \( C_{18-26} \) alkyl group and \( r \) is a number between 0 and 5.

Besides the compounds of Formulas (XII) and (XIII), short chain, water-soluble, quaternary ammonium compounds can also be employed, such as trihydroxethyl methyl ammonium methosulfate or the alkyl trimethyl ammonium chloride, dialkyl dimethyl ammonium chlorides and trialkyl methyl ammonium chlorides, e.g. cetyl trimethyl ammonium chloride, stearyl trimethyl ammonium chloride, distearyl dimethyl ammonium chloride, lauryl dimethyl ammonium chloride, lauryl dimethyl benzyl ammonium chloride and trietyl methyl ammonium chloride.

Protonated alkylamine compounds that exhibit a softening action, as well as the non-quaternary, protonated precursors of the cationic emulsifiers are also suitable.

The quaternized protein hydrolylates illustrate further inventively usable cationic compounds.

Suitable cationic polymers include the polyquaternium polymers such as those in the CTFA Cosmetic Ingredient Dictionary (The Cosmetic, Toiletry and Fragrance, Inc., 1997), particularly those polyquaternium-6, polyquaternium-7, polyquaternium-10 polymers also described as Merquats (Ucare Polymery IR 400; Ansercol), polyquaternium-4-co-polymer, such as graft copolymers with a cellulose backbone and quaternary ammonium groups that are bonded through allyl dimethyl ammonium chloride, cationic cellulose derivatives like cationic guar, such as guar hydroxypropyl trioxammonium chloride, and similar quaternized guar derivatives (e.g. Cosmedia Guar, manufactured by Cognis GmbH), cationic quaternary sugar derivatives (cationic alkyl polyglycosides), e.g. the commercial product Glucquat® 100, according to CTFA nomenclature a “Lauryl Methyl Glucquat® 100 Hydroxypropyl Dimonium Chloride”, copolymers of PVP and dimethylaminomethacrylate, copolymers of vinyl imidazole and vinyl pyrrolidone, aminosilicone polymers and copolymers.

Polyquaternized polymers (e.g. Luviquat Care from BASF) and also cationic biopolymers based on chitin and its derivatives, for example the polymer obtained under the trade name Chitosan® (manufacturer: Cognis) can also be employed.

Compounds of Formula (XVII) are likewise usable,

\[
\text{(XVII)}
\]

which can be alkylamido amine amides in their non-quaternary form or, as shown, in their quaternary form. \( R^{17} \) can be an aliphatic alk(en)yl group having 12 to 22 carbon atoms with 0, 1, 2 or 3 double bonds, \( q \) can assume values between 0 and 5. \( R^{18} \) and \( R^{19} \) stand, independently of one another, each for \( C_{1-4} \) alkyl or hydroxalkyl. Preferred compounds are fatty acid amido amine amides such as stearylamidopropyl dimethylamine, available under the trade name Tego Amido® S 18 or 3-tallowamidopropyl trimethyl ammonium methosulfate, available under the trade name Stepanex® X 9124, which are characterized by their good conditioning action as well as by their color transfer inhibiting action and particularly by their good biodegradability.

Alkylated quaternary ammonium compounds having at least one alkyl chain interrupted by an ester group
and/or an amido group, particularly N-methyl-N(2-hydroxyethyl)-N,N-(ditallowcayloxyethyl)ammonium methosulfate are particularly preferred.

The non-ionic softeners primarily include polyoxyalkylene glycerol alkanoates, as described in the British Patent GB 2,202,244, polybutylenes, as described in the British Patent GB 2,199,855, long chain fatty acids as described in EP 13,780, ethoxylated fatty acid ethanolamides, as described in EP 43,547, alkyl polyglycosides, especially sorbitan mono-, di- and triesters, as described in EP 698,140 and fatty acid esters of polycarboxylic acids as described in the German Patent DE 2,822,891.

In the inventive composition, softeners can be comprised in amounts of 1 to 90 wt. %, preferably 3 to 35 wt. %, each based on the total composition.

Moreover, inventive compositions can comprise fatty alcohols and/or fatty acids.

Fatty acids—singly or in mixtures—used for manufacturing fatty alcohols are fatty acids such as capric acid, caprylic acid, capric acid, 2-ethylhexanoic acid, lauric acid, myristic acid, palmitic acid, palmoleic acid, isostearic acid, stearic acid, hydroxy stea ric acid (ricinoleic acid), dihydroxystearic acid, oleic acid, linoleic acid, petroselic acid, elaidic acid, arachidic acid, behenic acid and erucic acid as well as their industrial mixtures, as for example occur from the pressure cracking of natural fats and oils such as oleic acid, linoleic acid, linolenic acid, and especially rapeseed oil fatty acid, soya oil fatty acid, sunflower oil fatty acid, tallow fatty acid. In principle, all fatty acids with similar chain distributions are suitable.

The content of unsaturated fractions of these fatty acids or fatty acid esters—when required—is adjusted by means of the known catalytic hydrogenation process to a desired iodine number or by mixing fully hydrogenated fatty components with non-hydrogenated fatty components.

The iodine number, as a quantitative measure for the average degree of saturation of a fatty acid, is the quantity of iodine that is taken up by 100 g of the compound whose double bonds are to be saturated.

Partially hydrogenated C<sub>10</sub>-<sub>18</sub> coco or palm fatty acids, rape seed oil fatty acids, sunflower oil fatty acids, soya oil fatty acids and tallow oil fatty acids, with iodine numbers in the range ca. 80 to 150 and especially industrial C<sub>10</sub>-<sub>18</sub> coco fatty acids are used, wherein optionally, a choice of cis/trans isomers such as elaidic acid-rich C<sub>10</sub>-<sub>18</sub> fatty acid fractions can be advantageous. They are commercial products and are offered by various companies under their respective trade names.

The addition of pH adjusters can be considered for bringing the pH of the inventive composition into the desired range. Any known acid or alkali can be added, in so far as their addition is not forbidden on technological or ecological grounds or grounds of protection of the consumer. The amount of these adjustors does not normally exceed 10 wt. % of the total formulation.

Exemplary suitable pH adjustors are inorganic acids, such as hydrochloric acid, phosphoric acid, HBr and sulfuric acid as well as organic acids, such as formic acid, acetic acid, propionic acid, butyric acid, valeric acid, caproic acid, caprylic acid, 2-ethylhexanoic acid, capric acid, lauric acid, isostearic acid, myristic acid, palmitic acid, palm oleic acid, stearic acid, isostearic acid, oleic acid, elaidic acid, petroselic acid, linoleic acid, linolenic acid, elaeostearic acid, arachidonic acid, gadoleic acid, behenic acid and erucic acid as well as their technical mixtures. Suitable C<sub>12</sub>-C<sub>18</sub> dicarboxylic acids can also be employed, such as succinic acid, maleic acid, fumaric acid, glutaric acid, adipic acid and dodecane dicarboxylic acid. Hydroxy-functionalized polyvalent carboxylic acids, such as e.g. malic acid, tartaric acid and especially citric acid, are particularly suitable.

The inventive compositions are preferably aqueous and in a preferred embodiment, especially as rinse softeners, have a pH below 9, particularly preferably below 7.5, especially below 6, most preferably below 5, specifically from 2 to 4.5.

In a preferred embodiment, the preferably liquid compositions additionally comprise electrolytes for stabilization purposes, preferably alkali metal and/or alkaline earth metal metal salts, particularly preferably alkali metal and/or alkaline earth metal halides, especially the alkaline earth metal halides of magnesium and calcium, specifically magnesium and/or calcium chloride.

In a preferred embodiment, the inventive compositions additionally comprise odor absorbers. In the context of the invention, odor absorbers are one or a plurality of metal salts of a linear or branched, saturated or unsaturated, mono or polyhydroxylated fatty acids containing at least 16 carbon atoms and/or of a resin acid with the exception of the alkali metal salts, as well as any mixtures thereof.

A particularly preferred linear or branched, satu rated or unsaturated, mono or polyhydroxylated fatty acid containing at least 16 carbon atoms is ricinoleic acid. A particularly preferred resin acid is abietic acid.

Preferred metals are the transition metals and the lanthanoids, especially the transition metals of groups VIIa, lb and llb of the periodic system as well as lanthanum, cerium and neodymium, particularly preferably cobalt, nickel, copper and zinc, most preferably zinc. Although the cobalt, nickel and copper salts and the zinc salts are similarly effective, the zinc salts are preferred, however, on toxicological grounds.

One or a plurality of metal salts of ricinoleic acid and/or of abietic acid, preferably zinc ricinoleate and/or zinc abietate, especially zinc abietate are advantageously and therefore particularly preferably employed as the deodorizing substances.

In the context of the invention, cycloexodetrins as well as any mixtures of the abovementioned metal salts with cycloexodetrins have likewise proven to be further suitable deodorizing substances, preferably in a weight ratio of 1:10 to 10:1, particularly preferably 1:5 to 5:1 and especially 1:3 to 3:1. The term “cycloexodextrin” here includes all known cycloexodetrins, i.e. both unsubstituted cycloexodetrins containing 6 to 12 glucose units, especially alpha, beta and gamma cycloexodetrins and their mixtures and/or their derivatives and/or their mixtures.

For better dispersion, suspension or emulsification of the advantageously employable fabric softeners, the composition advantageously further comprises surfactants. The surfactants are selected from the group of the anionic, non-ionic, cationic, zwitterionic and amphoteric surfactants.

In a preferred embodiment, the inventive compositions can further comprise surfactants. The additional use of surfactants enhances the conditioning characteristics and contributes to an improved storage stability and dispersibility or emulsifiability of the individual conditioning agent components.
The added non-ionic surfactants are preferably alkoxylated, advantageously ethoxylated and/or propoxylated, particularly primary alcohols having preferably 8 to 18 carbon atoms and an average of 1 to 12 mol ethylene oxide (EO) and/or 1 to 10 mol propylene oxide (PO) per mol alcohol.

C_{12-14} alcohol alkoxylates, advantageously ethoxylated and/or propoxylated C_{10-15} alcohol alkoxylates, particularly C_{12-14} alkoxylates with an ethoxylate degree between 2 and 10, preferably between 3 and 8, and/or a propoxylate degree between 1 and 6, preferably between 1.5 and 5, are particularly preferred. The alcohol group can preferably be linear or particularly preferably be methyl branched in the 2-position or comprise a mixture of linear and methyl-branched groups, as is typically present in o xo-alcohol groups. Particularly preferred are, however, alcohol ethoxylates with linear groups from alcohols of natural origin with 12 to 18 carbon atoms, e.g. from coco-, palm-, tallow- or oleyl alcohol, and an average of 2 to 8 EO per mol alcohol.

Exemplary preferred ethoxylated alcohols include C_{12-14} alcohols with 3 EO or 4 EO, C_{16-18} alcohols with 7 EO, C_{13-15} alcohols with 5 EO, 7 EO or 8 EO, C_{12-14} alcohols with 5 EO, 7 EO or 8 EO and mixes thereof, as well as mixtures of C_{12-14} alcohol with 3 EO and C_{12-14} alcohol with 5 EO. The cited degrees of ethoxylation and propoxylation constitute statistical average values that can be a whole or a fractional number for a specific product. Preferred alcohol ethoxylates and propoxylates have a narrowed homolog distribution (narrow range ethoxylates/propoxylates, NRE/NRP). In addition to these non-ionic surfactants, fatty alcohols with more than 12 EO can also be used. Examples of these are tallow fatty alcohol with 14 EO, 25 EO, 30 EO or 40 EO.

Alkoxylated amines, advantageously ethoxylated and/or propoxylated, particularly primary and secondary amines having preferably 1 to 18 carbon atoms per alkyl chain and an average of 1 to 12 mol ethylene oxide (EO) and/or 1 to 10 mol propylene oxide (PO) per mol amine, are also suitable.

Furthermore, as additional non-ionic surfactants, alkyl glycosides that satisfy the general formula RO(G), can be added e.g. as compounds, particularly with anionic surfactants, where R means a primary linear or methyl-branched, particularly 2-methyl-branched, aliphatic group containing 8 to 22 preferably 12 to 18 carbon atoms and G stands for a glucose unit containing 5 or 6 carbon atoms, preferably for glucose. The degree of oligomerization x, which defines the distribution of monoglycosides and oligoglycosides, is any number between 1.0 and 10, preferably between 1.2 and 1.4.

Another class of preferred non-ionic surfactants which are used either as the sole non-ionic surfactant or in combination with other non-ionic surfactants, are alkoxylated, preferably ethoxylated or ethoxylated and propoxylated fatty acid alkyl esters preferably containing 1 to 4 carbon atoms in the alkyl chain, more particularly the fatty acid methyl esters which are described, for example, in Japanese patent application JP 58/217598 or which are preferably produced by the process described in International Patent application WO-A-90/13553.

Non-ionic surfactants of the amine oxide type, for example N-cocoalkyl-N,N-dimethylamine oxide and N-tallow alkyl-N,N-dihydroxyethylene oxide, and the fatty acid alkanoamides may also be suitable.

The so-called gemini surfactants can be considered as further surfactants. Generally speaking, such compounds are understood to mean compounds that have two hydrophilic groups and two hydrophobic groups per molecule. As a rule, these groups are separated from one another by a “spacer”. The spacer is usually a hydrocarbon chain that is intended to be long enough such that the hydrophilic groups are a sufficient distance apart to be able to act independently of one another. These types of surfactants are generally characterized by an unusually low critical micelle concentration and the ability to strongly reduce the surface tension of water. In exceptional cases, however, not only dimeric but also trimeric surfactants are meant by the term gemini surfactants.

Suitable gemini surfactants are, for example, sulfated hydroxy mixed ethers according to the German Patent application DE-A-43 21 022 or dimer alcohol bis- and trimer alcohol tris sulfates and ether sulfates according to the international patent application WO-A-96/23768. Blocked end group dimeric and trimeric mixed ethers according to the German Patent application DE-A-199 13 391 are especially characterized by their bifunctionality and multifunctionality. Thus, the cited blocked end group surfactants possess good wetting properties and are therefore poor foammers, such that they are particularly suited for use in automatic washing or cleaning processes.

However, gemini polyhydroxyfatty acid amides or poly-polyhydroxyfatty acid amides, such as those described in the international Patent applications WO-A-WO-A-95/19953, WO-A-95/19954 and WO-A-95/19955 can also be used.

Other suitable surfactants are polyhydroxyfatty acid amides corresponding to the Formula

\[ R \overset{\text{CO}}{\longrightarrow} N \overset{\text{Z}}{\longrightarrow} \]

in which RCO stands for an aliphatic acyl group with 6 to 22 carbon atoms, R' for hydrogen, an alkyl or hydroxyalkyl group with 1 to 4 carbon atoms and [Z] for a linear or branched polyhydroxyalkyl group with 3 to 10 carbon atoms and 3 to 10 hydroxyl groups. The polyhydroxyfatty acid amides are known substances, which may normally be obtained by reductive amination of a reducing sugar with ammonia, an alkylamine or an alkanoamine and subsequent acylation with a fatty acid, a fatty acid alkyl ester or a fatty acid chloride.

The group of polyhydroxyfatty acid amides also includes compounds corresponding to the following Formula,

\[ R \overset{\text{CO}}{\longrightarrow} N \overset{\text{Z}}{\longrightarrow} \]

in which R is a linear or branched alkyl or alkene group containing 7 to 12 carbon atoms, R' is a linear, branched or cyclic alkyl group or an aryl group containing 2 to 8 carbon atoms and R'' is a linear, branched or cyclic alkyl group or an aryl group or an oxyalkyl group containing 1 to 8 carbon atoms, C_{14} alkyl or phenyl groups being preferred, and [Z] is a linear polyhydroxyalkyl group, of which the alkyl chain is substituted by at least two hydroxyl groups, or alkoxylated, preferably ethoxylated or propoxylated derivatives of that group.
[0127] [Z] is preferably obtained by reductive amination of a reducing sugar, for example glucose, fructose, maltose, lactose, galactose, mannos or xylose. The N-alkoxy- or N-aryloxy-substituted compounds may then be converted, for example according to the teaching of the international application WO-A-95/07331, into the required polyhydroxyfatty acid amides by reaction with fatty acid methyl esters in the presence of an alkoxide as catalyst.

[0128] Preferred non-ionic surfactants are one or a plurality of linear or branched, saturated or unsaturated C_{10-22} alcohols that are alkoxylated with ethylene oxide (EO) and/or propylene oxide (PO) with an alkoxylate degree of up to 30, preferably ethoxylated C_{10-18} fatty alcohols with an ethoxylate degree of less than 30, preferably 1 to 20, particularly 1 to 12, preferably 1 to 8, most preferably 2 to 5, for example C_{12-14} fatty alcohol ethoxylates with 2, 3 or 4 EO or a mixture of the C_{12-14} fatty alcohol ethoxylates with 3 and 4 EO in the weight ratio of 1 to 1 or isostriecyl alcohol ethoxylate with 5, 8 or 12 EO, such as for example described in DE 40 14 055 C2 (Grillo-Werke), to which reference is made and the contents of which are incorporated into this application.

[0129] The non-ionic surfactants can normally be present in quantities of up to 50 wt. %, particularly from 0.1 to 40 wt. %, preferably from 0.5 to 30 wt. %, especially from 2 to 25 wt. %, each based on the total agent.

[0130] The inventive compositions can optionally further comprise amphoteric surfactants. Besides numerous mono to trialkylated amine oxides, the betaines illustrate an important class.

[0131] Betaines illustrate known surfactants that are principally manufactured by carboxyalkylation, preferably carboxymethylation of amino compounds. The starting materials are preferably condensed with carboxylic acid halides or their salts, especially with sodium chloroacetate, one mole salt being formed per mole betaine. Furthermore, the addition of unsaturated carboxylic acids, such as for example acrylic acid, is also possible. Concerning the nomenclature and in particular the distinction between betaines and “true” amphoteric surfactants, reference is made to the paper of U. Ploog in Seifen-Ole-Fette-Wachse, 108, 373 (1982). Additional reviews of this topic can be found, for example, by A. O. Lennick et al. in HAPPI, Nov. 70 (1986), S. Holzmann et al. in Tens. Surf. Det. 23, 309 (1986), R. Bibo et al. in Soap Cosm. Chem. Spec. Apr. 46 (1990) and P. Ellis et al. in Euro Cosm. 1, 14 (1994). Examples of suitable betaines are illustrated by the carboxyalkylation products of secondary and especially tertiary amines, which have the formula (XVIII)

![Image](image_url)

in which R^1 stands for alkyl and/or alkkenyl groups with 6 to 22 carbon atoms, R^2 for hydrogen or alkyl groups with 1 to 4 carbon atoms, R^3 for alkyl groups with 1 to 4 carbon atoms, n for numbers from 1 to 6 and X^1 for an alkali metal and/or alkaline earth metal or ammonium. Typical examples are the carboxymethylation products of hexylimethyamine, hexyldimethyamine, heptyldimethyamine, octyldimethyamine, decyldimethyamine, dodecyldimethyamine, dodecyldimethylamine, dodecylethylmethylamine, C_{12-14} cocoalkylidimethyamine, myristyldimethyamine, cetyltrimethylamine, stearyldimethyamine, stearylethylmethylamine, oleylidimethyamine, C_{16-18} tallowalkylidimethylammonium as well as their industrial mixtures.

[0132] In addition, carboxyalkylation products of amido amines which have the formula (XIX) come into consideration.

![Image](image_url)

in which R^4CO stands for an aliphatic group with 6 to 22 carbon atoms and 0 or 1 to 3 double bonds, m for numbers from 1 to 3 and R^2, R^3, n and X^2 have the above meanings. Typical examples are the reaction products of fatty acids containing 6 to 22 carbon atoms, namely caprylic acid, caprylic acid, capric acid, lauric acid, myristic acid, palmitic acid, palmitoleic acid, stearic acid, isooleic acid, oleic acid, elaidic acid, petroselinic acid, linoleic acid, linolenic acid, elaeostearic acid, arachidonic acid, gadoleic acid, behenic acid and erucic acid as well as their technical mixtures, with N,N-dimethylaminoethylamine, N,N-dimethylaminopropylamine, N,N-diethylaminoethylamine and N,N-diethylaminoethylamine, which are condensed with sodium chloroacetate. A condensation product of C_{10-14} coco fatty acid-N,N-dimethylaminopropylamide with sodium chloroacetate is preferably employed.

[0133] In addition, suitable starting materials for the betaines that can be employed in the context of the invention are imidazolines of formula (XX),

![Image](image_url)

in which R^5 stands for an alkyl group with 5 to 21 carbon atoms, R^6 for a hydroxyl group, a OCOR-— or NHCOR group and m stands for 2 or 3. These substances are also known materials, which, for example, can be obtained by condensation/cyclization of 1 or 2 moles fatty acid with polyamines, such as, for example aminoethylethanolamine (AEEA) or diethylenetriamine. Mixtures of different open chain betaines illustrate the corresponding carboxyalkylation products. Typical examples are condensation products of the abovementioned fatty acids with AEEA, preferably imidazolines based on lauric acid or in turn C_{12-14} coco fatty acid, which are subsequently betainized with sodium chloroacetate.

[0134] In a preferred embodiment, the inventive compositions exist in liquid form. In order to obtain a liquid consistence, it may be advisable to add both a liquid organic solvent as well as water. Thus, the inventive laundry conditioning agents optionally comprise solvents.

[0135] Solvents that can be especially added to rinse softeners originate, for example, from the group of mono- or polyhydric alcohols, alkanolamines or glycol ethers, in so far that they are miscible with water in the defined concentration.
range. Preferably, the solvents are selected from ethanol, n- or i-propanol, butanols, glycol, propane diol or butane diol, glycercine, diglycol, propyl diglycol or butyl diglycol, hexylene glycol, ethylene glycol methyl ether, ethylene glycol ethyl ether, ethylene glycol propyl ether, ethylene glycol mono-n-butyl ether, diethylene glycol methyl ether, diethylene glycol ethyl ether, propylene glycol methyl-, ethyl- or propyl ether, butoxy propano propyl (BPP), dipropylene glycol methyl-, or ethyl ether, disopropylene glycol monomethyl-, or ethyl ether, methoxy- or butoxy triglycol, 1-butoxyethoxy-2-propanol, 3-methyl-3-methoxybutan-0-propylene glycol 1-butyl ether as well as mixtures of these solvents.

[0136] Some glycol ethers are available under the trade names Arcosolv® (Arco Chemical Co.) or Cellosolve®, Carbitol® or Propanol® (Union Carbide Corp.); ButylCarbitol®, HexylCarbitol®, MethylCarbitol®, and Carbitol® itself; (2-(2-ethoxyethoxy)ethanol also belong to this group, for example. The choice of the glycol ether can be easily made by the expert on the basis of volatility, water-solubility, content by percentage weight of the total dispersion and suchlike. Pyrrolidone solvents, such as N-alkyl pyrrolidones, for example N-methyl-2-pyrrolidone or N-C₂H₂N., alkyl pyrrolidone or 2-pyrrolidone can also be added. Further preferred are solvent solvents or as a component of a mixture of solvents are glycerine derivatives, particularly glycerine carbonate.

[0137] Alcohols that can be added in the present invention as cosolvent include liquid polyethylene glycols with a low molecular weight, for example polyethylene glycols with a molecular weight of 200, 300, 400 or 600. Additional suitable cosolvents are alcohol, for example (a) lower alcohols, such as ethanol, propional, isopropanol and n-butanol, (b) ketones, such as acetone and methyl ethyl ketone, (c) C₂-C₆ polyalcohols, such as a diol or a triol, for example ethylene glycol, propylene glycol, glycerine or mixtures thereof. From the class of diols, 1,2-octane diol is particularly preferred.

[0138] In a preferred embodiment, the inventive composition comprises one or a plurality of solvents from the group that includes C₆-C₈ monoalcohols, C₈-C₁₀ glycals, C₁₀-C₁₂ glycol ethers and glycerine, particularly ethanol. The inventive C₆-C₁₀ glycol ethers 40 wt. % use alkyl or aryl groups with less than 10 carbon atoms, preferably up to 6, particularly preferably up to 4 and most preferably 2 to 3 carbon atoms.

[0139] Preferred C₆-C₁₀ monoalcohols are ethanol, n-propanol, iso-propanol and tert.-butanol. Preferred C₆-C₁₀ glycals are ethylene glycol, 1,2-propylene glycol, 1,3-propylene glycol, 1,5-pentane diol, neopentyl glycol and 1,6-hexane diol, particularly ethylene glycol and 1,2-propylene glycol. Preferred C₆-C₁₀ glycol ethers are di-, tri-, tetra- and penta-ethylene glycol, di-, tri- and tetrapropylene glycol, propylene glycol monomethoxy butyl ether and propylene glycol monooxyethyl ether as well as the solvents designated according to INCI as butoxy diglycol, butoxyethanol, butoxyisopropanol, butoxypropoxynol, butyloctanol, ethoxydiglycol, ethoxyethanol, ethyl hexane diol, isobutoxypropanol, isopentyl diol, 3-methoxybutanol, methoxyethanol, methoxyisopropanol and methoxyethylbutanol.

[0140] The inventive composition, especially as a rinse softener, can comprise one or a plurality of solvents in a quantity of usually up to 40 wt. %, advantageously 0.1 to 30 wt. %, particularly 2 to 20 wt. %, particularly preferably 3 to 15 wt. %, most preferably 5 to 12 wt. %, for example 5.3 or 10.6 wt. %, each based on the total agent.

[0141] In a preferred embodiment, the inventive composition optionally comprises water in an amount of more than 50 wt. %, particularly 60 to 95 wt. %, particularly 70 to 93 wt. % and most preferably 80 to 90 wt. %.

[0142] In addition, the inventive composition can comprise one or more typical auxiliaries and additives, particularly selected from the group of the builders, enzymes, bleaching agents, bleach activators, electrolites, pH adjusters, complexing agents, fragrances, perfume carriers, fluorescence agents, colorants, foam inhibitors, anti-graying inhibitors, anti-cresing agents, antimicrobials, germicides, fungicides, antioxidants, antistatics, ironing auxiliaries, UV-absorbers, optical brighteners, antiredeposition agents, viscosity regulators, pearlers, color-transfer inhibitors, anti-shrinkage agents, corrosion inhibitors, preservatives, water-proofing and impregnation agents, hydrodopropes, silicone oils as well as swelling and non-slip agents.

[0143] In a preferred embodiment, the inventive composition optionally comprises, in addition, one or a plurality of chelating agents.

[0144] The INCI term “chelating agents” are also known as sequestrants and are ingredients that are capable of complexing and inactivating metal ions so as to prevent their detrimental action on stability or on the appearance of the agent, e.g. turbidity. It is important to complex the calcium and magnesium ions in hard water, as they are incompatible with numerous ingredients. Complexing heavy metal ions like iron or copper slows down the oxidative decomposition of the finished agent. Further suitable chelating agents as named in INCI are for example the following that are described in more detail in the International Cosmetic Ingredient Dictionary and Handbook: aminotrimethylene phosphonic acid, beta-alanine diacetic acid, calcium disodium EDTA, citric acid, cyclodextrin, cyclohexandimide tetraacetic acid, dianmonium citrate, dianmonium EDTA, diethylenetriamine pentamethylene phosphonic acid, dipotassium EDTA, disodium azacyclolpeptide diphosphonate, disodium EDTA, disodium pyrophosphate, EDTA, etridroc acid, galactaric acid, glucionic acid, glucaric acid, HEDTA, hydroxypropyl cyclodextrin, methyl cyclodextrin, pentaoctosnium triphosphate, pentasodium aminotrimethylene phosphonate, pentasodium ethylenediamine tetramethylene phosphate, pentasodium pentate, pentasodium triphosphate, pentetic acid, phytic acid, potassium citrate, potassium EDTMP, potassium gluconate, potassium polyphosphate, potassium triphosphononometilamine oxide, ribonic acid, sodium chitosan methylene phosphate, sodium citrate, sodium diethylenetriamine pentamethylene phosphate, sodium dihydroxyethylglycinate, sodium EDTMP, sodium glucetate, sodium gluconate, sodium glycercet-1 polyphosphate, sodium hexametaphosphate, sodium metaphosphate, sodium metasilicate, sodium phytate, sodium polydimethylglycineophenol sulfonate, sodium trimetaphosphate, TEA-EDTA, TEA-polyphosphate, tetrahydroxyethyl ethylenediamine, tetrahydroxypropyl ethylenediamine, tetrapotassium etidronate, tetrapotassium pyrophosphate, tetrasodium EDTA, tetrasodium etidronate, tetrasodium pyrophosphate, tripotassium EDTA, trisodium dicarboxymethyl alaninate, trisodium EDTA, trisodium HEDTA, trisodium NTA and trisodium phosphate.

[0146] Preferred chelating agents are tertiary amines, particularly tertiary alkanolamines (amino alcohols). The
alkanolamines possess both amino and hydroxyl and/or other groups as functional groups. Particularly preferred tertiary alkanolamines are triethanolamine and tetra-2-hydroxypropylethylene diamine (N,N,N’,N’-tetraakis-(2-hydroxypropyl) ethylene diamine). Particularly preferred combinations of tertiary amines with zinc ricinoleate and one or a plurality of ethoxylated fatty alcohols as the non-ionic surfactant as well as optional solvents are described in DE-40 14 055 C2 (Grillo-Werke) to which reference is made in this context and the contents of which are hereby incorporated into this application.

[0147] A particularly preferred chelating agent is the ethidric acid (1-hydroxyethylidene-1,1-diphosphonic acid, 1-hydroxyethane-1,1-diphosphonic acid, HEDP, acetophosphonic acid, INCI Etidronic Acid) including its salts. In a preferred embodiment, the inventive agent accordingly comprises etidronic acid and/or one or more of its salts as the chelating agent.

[0148] In a preferred embodiment, the inventive composition comprises a combination of chelating agents from one or a plurality of tertiary amines and one or a plurality of additional chelating agents, preferably one or a plurality of chelating agents or their salts, particularly from triethanolamine and/or tetra-2-hydroxypropylethylene diamine and etidronic acid and/or one or a plurality of its salts.

[0149] The inventive composition comprises chelating agents in quantities of typically 0 to 20 wt. %, advantageously 0.1 to 15 wt. %, particularly 0.5 to 10 wt. %, preferably preferably 1 to 8 wt. %, most preferably 1.5 to 6 wt. %, for example 1.5, 2.1, 3 or 4.2 wt. %.

[0150] In a further embodiment, the inventive composition optionally comprises one or a plurality of viscosity regulators that preferably function as thickeners. The viscosity of the agent can be measured using standard methods (for example using a Brookfield-Viscosimeter RVD-VII at 20 rpm and 20°C, spindle 3) and lies preferably in the range from 10 to 5000 mPas. Preferred agents in liquid form have viscosities from 20 to 4000 mPas, particularly preferably from 40 to 2000 mPas.

[0151] Suitable thickeners are inorganic or polymeric organic compounds. Mixtures of a plurality of thickeners can also be used.

[0152] The inorganic thickeners include, for example, polysilicic acids, mineral clays like montmorillonite, zeolites, silicic acids, aluminum silicates, layered silicates and bentonites.

[0153] The organic thickeners come from the groups of the natural polymers, derivatives of natural polymers and the synthetic polymers.

[0154] Exemplary, naturally occurring polymers that can be used as thickeners are xanthane, agar agar, carrageenan, tragacanth, gum Arabic, alginates, pectins, polysours, guar meal, galan gum, locust bean flour, starches, dextrins, gelatines and casein.

[0155] Modified natural products occur mainly from the group of modified starches and celluloses, examples being carboxymethyl cellulose and other cellulose ethers, hydroxyethyl and hydroxypropyl cellulose, highly etherified methyl hydroxyethyl cellulose as well as bean flour ether.

[0156] A major group of thickeners that are widely used in the most varied applications are the synthetic polymers such as polyacrylic and poly)methacrylic compounds that can be crosslinked or non-crosslinked and optionally cationically modified, vinyl polymers, polycarboxylic acids, polyethers, activated polyamide derivatives, castor oil derivatives, polyamines, polymides and polyurethanes. Exemplary polymers are acrylic resins, ethyl acrylate acrylamide copolymers, acrylate ester methacrylate ester copolymers, ethyl acrylate acrylic acid methacrylic acid copolymers, N-methyl methacrylicamide, maleic anhydride methyl vinyl ether copolymers, polyether polyol copolymers as well as butadiene styrene copolymers.

[0157] Additional suitable thickeners are derivatives of organic acids as well as their alkoxide adducts, for example aryl polyglycol ethers, carboxylated nonylphenol ethoxylate derivatives, sodium alginates, diglycerine monoisoostearate, non-ionic ethylene oxide adducts, coco fatty acid diethanolamide, isodecenedecyl succinimide anhydride as well as galactomannan.

[0158] Thickeners from the cited classes of substances are commercially available and are offered, for example, under the trade names Acusol®-820 (methacrylic acid (stearylalkohol-20-EO)ester-acrylic acid copolymer, 30% in water, Rohm & Haas), Dapril®-GT-282-S (alkylpolyglycol ether, Akzo), Deuteron®-Polymer-11 (dicarboxylic acid copolymer, Schöner GmbH), Deuteron-®-XG (anionic heteropolyaccharide based on β-D-glucose, D-mannose, D-glucuronic acid, Schöner GmbH), Deuteron®-XN (non-ionic polysaccharide, Schöner GmbH), Dicyran®-Verdiicker-O (ethylene oxide adduct, 50% in water/isopropanol, Pferse Chemie), 50% and EMA-811 (ethylene-maleic anhydride copolymer, Monsanto), EMA-8-01 (polysilane emulsion, 19-21% in water/diglycol ether, Rohm & Haas), Mirrox®-AM (anionic acrylic acid acrylam copolymer dispersion, 25% in water, Stockhausen), SER-AD-FX-1100 (hydrophobic urethane polymer, Servo Delden), Shellflow®-S (high molecular weight polysaccharide, stabilized with formaldehyde, Shell), Shellflow®-XA (Xanthane biopolymer, stabilized with formaldehyde, Shell), Keizan, Keltrol T (Kelco).

[0159] In a further preferred embodiment, the inventive composition optionally comprises one or a plurality of enzymes, especially cellulases.

[0160] In addition, the composition can optionally comprise UV absorbers, which absorb onto the treated textiles and improve the light stability of the fibers and/or the light stability of the various ingredients of the formulation. UV-absorbers are understood to mean organic compounds (light-protective filters) that are able to absorb ultra violet radiation and emit the absorbed energy in the form of longer wavelength radiation, for example as heat. Compounds, which possess these desired properties, are for example, the efficient radiationless deactivating compounds and derivatives of benzophenone having substituents in position(s) 2 and/or 4. Also suitable are substituted benzoazoles, such as for example the water-soluble sodium salt of 3-(2H-benzoazol-2-yl)-4-hydroxy-5-(methylpropyl)benzenesulfonic acid (Cibafast® H), acrylates, which are phenyl-substituted in position 3 (cinnamic acid derivatives) optionally with cyan groups in position 2, salicylates, organic Ni complexes, as well as natural products such as umbelliferone and the endogenous urocanic acid. The biphenoxy and above all the stilbene derivatives such as for example those described in EP 0 728 749 A, and commercially available as Tinosorb® FD or Tinosorb® FR from Ciba, are of particular importance. As UV-B absorbers can be cited: 3-benzylidenecamphor or 3-benzylidenonomochamphor and its derivatives, for example 3-(4-methylbenzylidene)camphor, as described in EP 0 693 471 B1; 4-amino/benzoic acid derivatives, preferably the
2-ethylhexyl ester of 4-(dimethylamino)benzoic acid, the 2-octyl ester of 4-(dimethylamino)benzoic acid, and the amyl ester of 4-(dimethylamino)benzoic acid; esters of cinnamic acid, preferably the 2-ethylhexyl ester of 4-methoxyxycinnamic acid, the propyl ester of 4-methoxyxycinnamic acid, the isoamyl ester of 4-methoxyxycinnamic acid, the 2-ethylhexyl ester of 2-ethylamino-3,3-phenylxycinnamic acid, (Octotylene); esters of salicylic acid, preferably the 2-ethylhexyl ester of salicylic acid, the 4-isopropylbenzyl ester of salicylic acid, the homomethyl ester of salicylic acid; derivatives of benzophenone, preferably 2-hydroxy-4-methoxybenzophenone, 2-hydroxy-4-methoxy-4'-methylbenzophenone, 2,2'-dihydroxy-4-methoxybenzophenone; esters of benzalmonic acid, preferably the di-2-ethylhexyl ester of 4-methoxybenzalmonic acid; triazine derivatives, such as, for example 2,4,6-triamino-1-(p-carbo-2'-ethyl-1'-hexyloxy)-1,3,5-triazine and octy triazine, as described in EP 0 818 450 A1 or diocyl butamidotriazone (Uvasorb® HEB); propane-1,3-diones, such as for example 1-(4-tet.-butylphenyl)-3-(4'-methoxyphenyl)propane-1,3-dione; ketocyclol(5,2,1.0)decane derivatives, such as described in EP 0 694 521 B1. Further suitable are 2-phenylbenzimidazole-5-sulfonic acid and its alkali metal-, alkaline earth metal-, ammonium-, alkylammonium-, alkanolammonium- and glucammonium salts; sulfonic acid derivatives of benzophenones, preferably 2-hydroxy-4-methoxybenzophenone-5-sulfonic acid and its salts; sulfonic acid derivatives of 3-benzylidenecamphor, such as for example 4-(2-oxo-3-borylidenemethyl)benzene sulfonic acid and 2-methyl-5-(2-oxo-3-borylidene)-sulfonic acid and their salts.

[0161] Typical UV-A filters particularly include derivatives of benzylmethine, such as, for example 1-(4'-tet.-butylphenyl)-3-(4'-methoxyphenyl)propane-1,3-dione, 4-tet.-butyl-4'-methoxy dibenzylmethane (Parsol 1789), 1-phenyl-3-(4'-isopropylphenyl)propane-1,3-dione as well as enamine compounds, as described in the DE 1 971 2033 A1 (BASF).

Naturally, the UV-A and UV-B filters can also be added as mixtures. Beside the cited soluble materials, insoluble, light protecting pigments, namely finely dispersed, preferably, nano metal oxides or salts can also be considered for this task. Exemplary suitable metal oxides are particularly zinc oxide and titanium oxide and also oxides of iron, zirconium, silicon, manganese, aluminum and cerium as well as their mixtures. Silicates (talc), barium sulfate or zinc stearate can be added as salts. The oxides and salts are already used in the form of pigments for skin care and skin protection emulsions and decorative cosmetics. Here, the particles should have a mean diameter of less than 100 nm, preferably between 5 and 50 nm and especially between 15 and 30 nm. They can be spherical, however elliptical or other shaped particles can also be used. The pigments can also be surface treated, i.e. hydrophilized or hydrophobized. Typical examples are coated titanium dioxides, such as, for example Titandioxid T 805 (Degussa) or Eusolex® 12000 (Merek). Hydrophobic coating agents preferably include silicones and among them particularly trialkoxyxycylicanes or Simethicones. Micronized zinc oxide is preferably used. Further suitable UV light protection filters may be found in the review by P. Finkel in SFSW-Journal, Volume 122 (1996), p. 543.

[0162] The UV absorbers are normally used in amounts of 0.01 wt. % to 5 wt. %, preferably from 0.03 wt. % to 1 wt. %.

[0163] The inventive compositions can be obtained by the person skilled in the art according to standard techniques for manufacturing conditioning agents. The agents can be obtained by directly mixing their raw materials, optionally by means of high shear mixing equipment. For liquid formulations, the recommended procedure is to melt the optionally present softening components and to subsequently disperse the melt in a solvent, preferably water. The inventively utilizable silicon-containing compounds can be integrated into the conditioning agent by a simple mixing procedure.

[0164] The following examples are intended to exemplify the invention without limiting it in any way.

**Example 1**

Preparation and General Information

Finish:

[0165] Bleached cotton cloth 1.1.10 (cotton) was used as the textile to be finished and was dry irone smooth beforehand. For treatment, three test samples of dimensions 50x25 mm (in total 50x75 mm) were cut. The test sample (50x75 mm) in a crystallization dish was sprayed twice with a commercial spray adaptor, corresponding to an application of 0.023 g/cm².

[0166] Treatment with an Electric Iron:

[0167] The wet test sample was ironed dry for 10 seconds with an electric iron with the setting III. After cooling the test sample, it was cut up into three identical 50x25 mm samples and the crease recovery angle was determined.

[0168] Test Procedure

[0169] The crease recovery angle tester functions in accordance with the requirements of BS EN 22313, ISO 2313, M&S P22 and AATCC test method 66. It consists of two units. The first device consists of two rectangular weighted blocks that due to their weight crease the fabric. The second unit is the actual measurement equipment, with which the crease recovery angle is determined.

[0170] Load

[0171] The test sample (50x25 mm) is held together at each end by a plastic peg. Not more than 5 mm material may be gripped. The crease is produced by the load of a flat weighted block having a defined weight of 19.63 N (2 kg) for a period of 5 minutes.

[0172] Measuring the Crease Recovery

[0173] Using the supplied steel tweezers, the creased material sample is carefully placed into the clamp. After fixing it in position, the material is also clamped into the upper clamping jaw. The vertical position serves as the reference point. When the creased material touches this point by turning the angle wheel, the angle is read on the angle wheel.

[0174] The measurement is made 5 minutes after removing the weight from the wheel or after the crease formation. In general, the greater the crease recovery angle, the better is the anti-crease behavior of the creased material sample.

[0175] Investigated Substances

| hansa SQF 2620 | diquaternized polydimethylsiloxane (Silikonquat) |
| hansa ASM 9180 | higher alkyl modified amido aminosiloxane |
| arristan 64 | aminosilylsiloxane |
| hansa SWE 3620 | alkyl modified polydimethylsiloxane (silicone wax) |
EXAMPLE 2
Experimental Results

[0176] The crease recovery angle difference (CRA) for each comparison (water, commercial silicone-containing agent or a 3% ethanol solution) is given in the table of results. A positive number means an increase in the crease recovery angle and thus a performance increase.

[0177] 2.1. On Top Investigations
[0178] For these tests, a commercial silicone-containing agent was added on top of the active substance in a concentration of 1% active substance. The treatment was carried out as described in example 1.

<table>
<thead>
<tr>
<th>Substances</th>
<th>CRA compared to water</th>
<th>CRA compared to commercial agent</th>
</tr>
</thead>
<tbody>
<tr>
<td>Hansa SQE 2620</td>
<td>5</td>
<td>13</td>
</tr>
<tr>
<td>Hansa SME 3620</td>
<td>11</td>
<td>19</td>
</tr>
<tr>
<td>Hansa ASM 9180</td>
<td>28</td>
<td>36</td>
</tr>
<tr>
<td>Arristan 64</td>
<td>20</td>
<td>28</td>
</tr>
</tbody>
</table>

[0179] It can be seen that above all the amidoaminosiloxane and the aminoalkylsiloxane show good anti-creasing performance.

[0180] 2.2. Investigations for Replacing the Silicone oil in the Commercial Agent

[0181] 2.2.1.
[0182] For these tests, the active substance was dissolved in a concentration of 1% active substance in a 3% ethanol solution. The treatment was carried out as described in example 1.

<table>
<thead>
<tr>
<th>Substances</th>
<th>CRA compared to water</th>
<th>CRA compared to commercial agent</th>
</tr>
</thead>
<tbody>
<tr>
<td>Hansa SQE 2620</td>
<td>20</td>
<td>15</td>
</tr>
<tr>
<td>Hansa SME 3620</td>
<td>23</td>
<td>18</td>
</tr>
<tr>
<td>Arristan 64</td>
<td>28</td>
<td>23</td>
</tr>
<tr>
<td>Hansa ASM 9180</td>
<td>30</td>
<td>25</td>
</tr>
</tbody>
</table>

[0183] One can see the good performance of the amidoaminosiloxane and the aminoalkylsiloxane. The slightly worse CRA differences to the commercial agent are also consistently present in the following experiments and are always of the order of 5°. The difference established for the individual test series is given separately.

[0184] 2.2.2.a
[0185] As a result of the better performance of the on top formulations in comparison with the basic recipes, it can be concluded that there are synergistic effects between the different siloxanes. Test for the determination of an optimal mixture are discussed below.

[0186] For these tests, each of the active substances was dissolved in a concentration of 0.5% active substance (1% total concentration of active substances) in a 3% ethanol solution. The treatment was carried out as described in example 1. The CRA of the commercial agent and the CRA of water/ethanol (3%) served as the reference; CRA difference: 4°

<table>
<thead>
<tr>
<th>Siloxane mixture (0.5%/0.5%)</th>
<th>CRA compared to water/ethanol (3%)</th>
<th>CRA compared to commercial agent</th>
</tr>
</thead>
<tbody>
<tr>
<td>Hansa SME 3620/Aristran 64</td>
<td>24</td>
<td>20</td>
</tr>
<tr>
<td>Hansa SME 3620/Hansa ASM 9180</td>
<td>18</td>
<td>20</td>
</tr>
<tr>
<td>Hansa SME 3620/AG Silo 2620</td>
<td>23</td>
<td>19</td>
</tr>
<tr>
<td>Hansa SME 3620/Hansa ASM 9180</td>
<td>35</td>
<td>31</td>
</tr>
<tr>
<td>Hansa SQE 2620/Aristran 64</td>
<td>29</td>
<td>25</td>
</tr>
<tr>
<td>Hansa ASM 9180/Aristran 64</td>
<td>35</td>
<td>31</td>
</tr>
</tbody>
</table>

[0187] 2.2.2.b.
[0188] For these tests, the active substances were dissolved in a concentration of 0.4% and 0.6% active substance (1% total concentration of active substances) in a 3% ethanol solution. The treatment was carried out as described in example 1. The CRA of the commercial agent and the CRA of water/ethanol (3%) served as the reference; CRA difference: 6°

<table>
<thead>
<tr>
<th>Siloxane mixture</th>
<th>0.6/0.4 mixture</th>
<th>0.4/0.6 mixture</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>CRA in comparison to water/ethanol (3%)</td>
<td>CRA in comparison to water/ethanol (3%)</td>
</tr>
<tr>
<td></td>
<td>CRA in comparison to commercial agent</td>
<td>CRA in comparison to commercial agent</td>
</tr>
<tr>
<td>Hansa SQE 2620</td>
<td>18</td>
<td>12</td>
</tr>
<tr>
<td>Hansa ASM 9180</td>
<td>18</td>
<td>12</td>
</tr>
<tr>
<td>Hansa ASM 9180</td>
<td>18</td>
<td>12</td>
</tr>
<tr>
<td>Arristan 64</td>
<td>18</td>
<td>12</td>
</tr>
</tbody>
</table>

[0189]
Each underlined product refers to the corresponding concentration.

For these tests, the active substances were dissolved in a concentration of 0.3% and 0.7% active substance (1% total concentration of active substances) in a 3% ethanol solution. The treatment was carried out as described in example 1. The CRA of the commercial agent and the CRA of water/ethanol (3%) served as the reference; CRA difference: 5°

For these tests, the active substances were dissolved in a concentration of 0.3% and 0.7% active substance (1% total concentration of active substances) in a 3% ethanol solution. The treatment was carried out as described in example 1. The CRA of the commercial agent and the CRA of water/ethanol (3%) served as the reference; CRA difference: 5°

<table>
<thead>
<tr>
<th>Siloxane mixture</th>
<th>CRA in comparison to water/ethanol (3%)</th>
<th>CRA in comparison to commercial agent</th>
</tr>
</thead>
<tbody>
<tr>
<td>Tubingal FAM/</td>
<td>21</td>
<td>16</td>
</tr>
<tr>
<td>Hansa ASM 9180</td>
<td>20</td>
<td>15</td>
</tr>
<tr>
<td>Hansa SQE 2620/Hansa ASM 9180</td>
<td>24</td>
<td>25</td>
</tr>
<tr>
<td>Hansa ASM 9180</td>
<td>24</td>
<td>19</td>
</tr>
<tr>
<td>Arristan 64</td>
<td>24</td>
<td>19</td>
</tr>
</tbody>
</table>

Each underlined product refers to the corresponding concentration.

From the tests, particularly good mixtures are:

Hansa ASM 9180/Arristan 64 (0.4/0.6)
Hansa ASM 9180/Arristan 64 (0.5/0.5)
Hansa SQE 2620/Hansa ASM 9180 (0.5/0.5)
Hansa ASM 9180/Arristan 64 (0.21/0.08)

The concentration of the siloxanes was further reduced to a total active content of 0.35%. The following results were obtained:

<table>
<thead>
<tr>
<th>Siloxane mixture</th>
<th>CRA compared to water/ethanol (3%)</th>
<th>CRA compared to commercial agent</th>
</tr>
</thead>
<tbody>
<tr>
<td>Hansa ASM 9180 (0.35%)</td>
<td>22</td>
<td>9</td>
</tr>
<tr>
<td>Arristan 64 (0.35%)</td>
<td>22</td>
<td>8</td>
</tr>
<tr>
<td>Hansa ASM 9180 (0.18%)</td>
<td>22</td>
<td>8</td>
</tr>
<tr>
<td>Arristan 64 (0.18%)</td>
<td>22</td>
<td>8</td>
</tr>
<tr>
<td>Hansa SQE 2620 (0.18%)</td>
<td>22</td>
<td>8</td>
</tr>
<tr>
<td>Hansa ASM 9180 (0.14%)</td>
<td>22</td>
<td>8</td>
</tr>
</tbody>
</table>

Using the best mixture (product with Hansa ASM 9180 (0.14%)/Arristan 64 (0.21%)), more comparative tests were carried out with additional commercial products (example 3).

EXAMPLE 3

Comparison with Additional Commercial Products

Experimental: The Treatment Procedure Consisting of Fabric Treatment, Ironing and Washing Cycle was Repeated 4 Times.

3.1 Fabric Treatment:

Bleached cotton cloth 1.1.10 (cotton) was used as the textile to be finished and was cut up into four 20x120 cm test samples per treatment. Creases were produced by washing the fabric samples in a domestic washing machine (with H2O only) and hanging them up in a climatized room for 24 hours. The horizontal test samples were sprayed as homogeneously as possible with 10 sprays of a commercial spray adaptor. The applied quantity corresponded to 0.16 g/cm².

A commercial steam iron, Professional Laser from the Rowenta Company, from a home made automatic ironing apparatus, 67 cm wide, was drawn over the fabric. The speed was 53.3 mm/s (=3200 mm/min). The temperature of the iron was set to step III. The iron was weighted down with 2940 g of metal pellets. As the sliding surface of the iron was 23.5 cm long and had a maximum width of 12 cm, and the appliance, at the beginning and end of the measurement still laid on the fabric, there remained an approximately 20 cm long and 12 cm wide area on the fabric for the evaluation of the measurement data, for which a total of 400 measurement points (measurement values 300-700) from 1000 were used to calculate the mean value.

3.3 Procedure for the Ironing Test and Evaluation:

To minimize possible influences from moisture on the lower surface of the iron on the ironing force, the tests were subdivided into two measurement series. For each formulation, 5 fabric strips were each ironed 4 times with the added weight of 2940 g. Each of the first ironing passages was not included in the subsequent evaluation. Before each measurement the iron was heated until the indicator light switched itself off. During the measurement run the plug was pulled out in order to avoid the resistance of the electrical cord. Prior to each new formulation, the iron was cleaned with a citric acid solution (3%), with ethanol and with distilled water. A strip of fabric of each formulation was used for a preliminary ironing pass in order to warm up the ironing overlay to eliminate possible residues on the iron.

Drying any disappearance of the crease was observed visually after each pass.

3.4 Wash Cycle Test Conditions

Program: 40° C, whites/coloreds program
Wash cycles: 1
Load: 3.5 kg (test cloths + clean washing)
Dosage: 109 g PNW + 36 ml Vernel (Wild Rose)

The test samples were taken wet from the washing machine, hung up on a washstand and dried in a climatized room for 24 hours.
[0208] 3.5 Anti-Creasing Test According to AATCC 124

[0209] The creased test samples were visually evaluated and marked (1-5) against reference standards according to AATCC 124. The reference standard marked 1 contains the most creases. 5 is completely free of creases. The evaluation was carried out by 8 panelists. An average value was calculated from 8 different test values. Three test samples were treated with each product, such that in total 8x3 evaluation measurements were made per product.

[0210] 3.6 Results

## TABLE 1

<table>
<thead>
<tr>
<th>Siloxane mixture</th>
<th>1st Treatment</th>
<th>2nd Treatment</th>
<th>3rd Treatment</th>
</tr>
</thead>
<tbody>
<tr>
<td>H₂O</td>
<td>19.1</td>
<td>10.5</td>
<td>10.3</td>
</tr>
<tr>
<td>Commercial agent</td>
<td>16.4</td>
<td>8.7</td>
<td>7.5</td>
</tr>
<tr>
<td>Inventive agent</td>
<td>10.6</td>
<td>7.5</td>
<td>6.5</td>
</tr>
<tr>
<td>Commercial agent 2</td>
<td>9.8</td>
<td>8.5</td>
<td>7.4</td>
</tr>
<tr>
<td>Commercial agent 3</td>
<td>15.8</td>
<td>12.3</td>
<td>11.9</td>
</tr>
</tbody>
</table>

## TABLE 2

<table>
<thead>
<tr>
<th></th>
<th>Commercial Agent</th>
<th>Inventive Agent</th>
<th>Commercial Agent 2</th>
<th>Commercial Agent 3</th>
</tr>
</thead>
<tbody>
<tr>
<td>1st Treatment</td>
<td>4</td>
<td>3</td>
<td>4</td>
<td>4</td>
</tr>
<tr>
<td>2nd Treatment</td>
<td>4</td>
<td>3</td>
<td>4</td>
<td>4</td>
</tr>
<tr>
<td>3rd Treatment</td>
<td>3</td>
<td>2</td>
<td>3</td>
<td>4</td>
</tr>
</tbody>
</table>

## TABLE 3

<table>
<thead>
<tr>
<th></th>
<th>Commercial Agent</th>
<th>Inventive Agent</th>
<th>Commercial Agent 2</th>
<th>Commercial Agent 3</th>
</tr>
</thead>
<tbody>
<tr>
<td>1st Treatment</td>
<td>1</td>
<td>1</td>
<td>1</td>
<td>1</td>
</tr>
<tr>
<td>2nd Treatment</td>
<td>1.1</td>
<td>1.2</td>
<td>1.5</td>
<td>1</td>
</tr>
<tr>
<td>3rd Treatment</td>
<td>1</td>
<td>1.3</td>
<td>1.9</td>
<td>1.1</td>
</tr>
<tr>
<td>4th Treatment</td>
<td>1.2</td>
<td>2.2</td>
<td>1</td>
<td>1.2</td>
</tr>
</tbody>
</table>

## EXAMPLE 4

**Spraying and Smoothing**

[0211] 4.0 Experimental:

[0212] The single treatment procedure consists of the following partial steps: Washing, drying, anti-crease test (AATCC 124), spraying and smoothing, drying and anti-crease test (AATCC 124).

[0213] Preparation of the Test Samples

[0214] The bleached cotton cloth 1.1.10 was used as the test sample. The fabric, prewashed with washing powder, was cut up into sizes of 38x38 cm in accordance with AATCC 124. Three test samples were produced for each product.

[0215] Wash Cycle:

[0216] In order to produce creases, the fabric samples were washed as follows in a domestic washing machine.

- **Program:** 40° C, whites/coloreds
- **Wash cycles:** 1
- **Load:** 3.5 kg (test samples + clean washing)
- **Dosage:** 75 g PMP

## Drying Cycle

[0217] The wet washing was hung up on a washstand and dried in a climatized room for 24 hours.

## Anti-Crease Test According to AATCC 124

[0219] To determine the initial degree of creasing and thus a quantitative evaluation of the results, the creased test samples were also evaluated prior to the spray treatment according to MTCC 124. 7 different panelists took part in the evaluation, such that the evaluation consisted of 7x3 notes per product.

[0221] Spray Treatment:

[0222] The horizontal test samples were sprayed as homogeneously as possible with 5 sprays of a commercial spray adaptor of the old Perla spray bottle from a distance of 25 cm. The applied quantity corresponded to 0.08 g/cm².

## Smoothing

[0224] Directly after the spray treatment, the treated test sample was straightened out and smoothed by hand in each horizontal and vertical direction twice (see diagram).

## Drying:

[0225] The treated test samples were hung up on a washstand to dry in a climatized room for 30 minutes.

## Anti-Crease Test According to AATCC 124;

[0227] The treated test samples were visually evaluated and marked (1-5) against reference standards according to AATCC 124.

[0229] The reference standard marked 1 contains the most creases. 5 is completely free of creases. Marks of <1 and marks to the first decimal place may also be given.

[0230] The evaluation was carried out by 7 panelists. An average value was calculated from 7 different test values. Three test samples were treated with each product, such that in total 7x3 evaluation measurements were made per product.
Results

<table>
<thead>
<tr>
<th>Anti-crease evaluation according to AATCC 124 before and after a spray treatment (single values are average values from each 3 measurements)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
</tr>
<tr>
<td>(dry)</td>
</tr>
<tr>
<td>-------</td>
</tr>
<tr>
<td>Average before Spray treatment</td>
</tr>
<tr>
<td>Average after Spray treatment</td>
</tr>
</tbody>
</table>

The results show that the new formulation offers the following advantages:

- Easier ironing in the classical sense (reduced ironing force)
- Easier ironing by faster smoothing of the fabrics
- Crease reduction for creased/worn fabrics

**EXAMPLE 5**

Comparative Tests with the Commercial Rinse Softener

A commercial esterquat-containing rinse softener was used as the reference. The formulations were used in a 1:1 rinse softening liquor and then the anti-crease behavior of the fabrics was tested by means of the crease angle recovery tester.

<table>
<thead>
<tr>
<th>Formulation</th>
<th>Crease Recovery Angle (°) (Average of 3 measurements)</th>
<th>Difference from Reference (commercial esterquat-containing rinse softener)</th>
</tr>
</thead>
<tbody>
<tr>
<td>10% Esterquat + 0.59% Hansa ASM + 0.89% Arristan 64</td>
<td>120</td>
<td>+9</td>
</tr>
<tr>
<td>13% Esterquat + 0.41% Hansa ASM 9180 + 0.62% Arristan 64</td>
<td>114</td>
<td>+4</td>
</tr>
</tbody>
</table>

1-9. (canceled)

10. A composition comprising at least one aminooalkyldisiloxane and at least one higher alkyl-modified amido aminooalkyldisiloxane modified by a compound having at least two hydroxyl groups selected from the group consisting of hydroxyalkylcarboxylic acids, monosaccharides, disaccharides and mixtures thereof.

11. The composition according to claim 10, wherein at least one aminooalkyldisiloxane and at least one higher alkyl-modified amido aminooalkyldisiloxane each comprise a substance represented by the general formula (I):

\[
R^1 \quad \text{Si-O} \quad \text{Si-O} \quad \text{Si-O} \quad \text{Si-O} \quad \text{Si-R}^2
\]

wherein, for the at least one higher alkyl-modified amido aminooalkyldisiloxane, each R\(^1\) independently represents a substituent selected from the group consisting of a hydrogen atom, monovalent C\(_1\)-C\(_{18}\) hydrocarbon groups which may optionally be substituted with fluorine, chlorine or bromine, C\(_7\)-C\(_{12}\) alkoxy groups, C\(_7\)-C\(_{12}\) hydroxy groups, and alkyl glycol groups; each R\(^2\) independently represents an R\(^1\), an X group or a Y group, each X independently represents a group selected from the general formulae (II) and (III):

\[
-R^2\text{NZR}^4
\]

\[
-R^2\text{NR}^3\text{CH}2\text{NZR}^4
\]

wherein R\(^2\) represents a divalent C\(_1\)-C\(_{18}\) hydrocarbon group, R\(^4\) represents a hydrogen atom or a C\(_1\)-C\(_{18}\) alkyl group which may optionally be substituted with fluorine, chlorine or bromine, Z represents a residue derived from a compound having at least two hydroxyl groups selected from the group consisting of hydroxyalkylcarboxylic acids, monosaccharides, disaccharides and mixtures thereof, R\(^2\) represents a hydrogen atom or Z group, each Y independently represents a group selected from the general formulae (II) and (III):

\[
-R^2\text{NH}^4
\]

\[
-R^2\text{NE(CH}3\text{)}\text{NH}^4
\]

wherein R\(^2\) and R\(^4\) are as defined above, k has an average value of 0.5 to 50, l has an average value of 10 to 1500, m has an average value of 0 to 50 and p represents an integer of 2 to 4, with the proviso that the ratio of k:m is 10:1 to 0.1:1, and wherein, for the at least one aminooalkyldisiloxane of the general formula (I), each R\(^1\) independently represents a substituent selected from the group consisting of a hydrogen atom, monovalent C\(_1\)-C\(_{18}\) hydrocarbon groups which may optionally be substituted with fluorine, chlorine or bromine, C\(_7\)-C\(_{12}\) alkoxy groups, C\(_7\)-C\(_{12}\) hydroxy groups, and alkyl glycol groups; each R\(^2\) independently represents an R\(^1\) or a Y group, each Y independently represents a group selected from the general formulae (IV) and (V):

\[
-R^2\text{NH}^4
\]

\[
-R^2\text{NE(CH}3\text{)}\text{NH}^4
\]

wherein R\(^2\) represents a divalent C\(_1\)-C\(_{18}\) hydrocarbon group, R\(^4\) represents a hydrogen atom or a C\(_1\)-C\(_{18}\) alkyl group which may optionally be substituted with fluorine, chlorine or bromine, k is 0, l has an average value of 10 to 1500, m has an average value of 1 to 100, and p represents an integer of 2 to 4.

12. The composition according to claim 10, wherein Z represents a residue derived from a compound selected from...
the group consisting of uronic, aldonic and aldonic acids of the general formulae (VII), (VIII) and (IX):

\[
\begin{align*}
O-CH-[CH(OH)]_n-\text{CO-} & \quad \text{(VII)} \\
\text{HOOC-}[CH(OH)]_n-\text{CO-} & \quad \text{(VIII)} \\
\text{HOCH}_2-[CH(OH)]_n-\text{CO-} & \quad \text{(IX)}
\end{align*}
\]

wherein \(2 \leq n \leq 10\).


15. A fabric treatment agent comprising a composition according to claim 12.

16. An article comprising a container and a composition according to claim 10 disposed within the container.

17. The article according to claim 16, wherein the container comprises a spray dispenser.

18. A method comprising: (a) providing a composition according to claim 10; and (b) contacting a fabric with the composition.

19. The method according to claim 18, wherein the fabric is contacted with the composition in conjunction with finishing, ironing or rinsing the fabric.

20. A method comprising: (a) providing a composition according to claim 11; and (b) contacting a fabric with the composition.

21. The method according to claim 20, wherein the fabric is contacted with the composition in conjunction with finishing, ironing or rinsing the fabric.

22. A method comprising: (a) providing a composition according to claim 12; and (b) contacting a fabric with the composition.

23. The method according to claim 22, wherein the fabric is contacted with the composition in conjunction with finishing, ironing or rinsing the fabric.

* * * * *