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(54) **Fabric softening composition**

(57) Use of a skin benefit agent as an ingredient in a fabric softening composition to enable the fabric softening composition to render textile fabrics treated with

the composition capable of delivering the skin benefit agent to the skin with which the fabrics come into contact.

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Description

This invention relates to the incorporation of a skin benefit agent in a fabric softening composition such that when fabrics tested with the fabric softening composition subsequently come into contact with the skin the fabrics deliver a benefit to the skin

Rinse added fabric softener compositions are well known. Typically such compositions contain a water insoluble amine salt and/or a quaternary ammonium fabric softening agent dispersed in water at a level of softening agent up to 7% by weight in which case the compositions are considered dilute, or at levels from 7% to 50% in which case the compositions are considered concentrates. Quaternary ammonium materials with long chain substituents have been used in fabric softening compositions for many years. Often they are used in conjunction with co-actives such as fatty acids or other relatively cheap materials which also provide softening benefits.

In addition to softening, fabric softening compositions desirably have other benefits.

GB 1 601 359 (Procter and Gamble) describes the use of esters as an ingredient in a fabric softening composition which also comprises a cationic surfactant selected from various specified groups. The ester is one of a number of nonionic fabric lubricants suggested.

GB 1 550 205 (Procter and Gamble) disclose formulations containing silicones, cationic compounds and glycerol monostearate for ease of ironing, and softening benefits may be obtained without the ester oil when other nonionic softeners are substituted for the glycerol monostearate.

Fabric softening compositions containing silicones are well known and are disclosed in GB 1 549 180 (Procter & Gamble) and EP 356 210 (Dow Corning).

EP 0 436 729 (Kanebo) discloses an industrial process for applying microcapsules to fabric, which when contacted with the skin are physiologically active.

Accordingly the present invention provides the use of a skin benefit agent as an ingredient in a fabric softening composition to enable the fabric softening composition to render textile fabrics treated with the composition capable of delivering the skin benefit agent to the skin with which the fabrics come into contact.

The present invention also provides the use of a skin benefit agent in a fabric softening composition to impart sensory and/or cosmetic benefits to the skin when fabrics treated with the composition come into contact with the skin.

The skin benefit agents are preferably substantive to fabric. A skin benefit agent is suitably as any agent intended to be deposited onto the skin for the purpose of imparting sensory and/or cosmetic benefits thereto. It is preferred if the skin benefit agent changes the sensory perception of the skin. Examples of suitable skin benefit agents include moisturisers, skin softeners, emollients and sunscreens.

The skin benefit agent used in accordance with the present invention may be any liquid or solid provided that it is compatible with other ingredients of the fabric softening composition.

Preferred skin benefit agents include:-

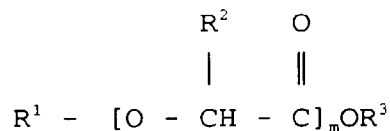
- a) waxes such as carnauba, spermaceti, beeswax, lanolin and derivatives thereof;
- b) hydrophobic plant extracts;
- c) hydrocarbons such as squalene and squalane;
- d) higher fatty acids such as those having at least 12 carbon atoms, for example, lauric, myristic, palmitic, stearic, behenic, oleic, linoleic linolenic, lanolic, isostearic and poly unsaturated fatty acids (PUFA) acids;
- e) higher fatty alcohols such as those having at least 12 carbon atoms, for example, lauryl, cetyl, stearyl, oleyl, behenyl, cholesterol and 2-hexadecanol alcohol;
- f) esters such as cetyl octanoate, lauryl lactate, myristyl lactate, cetyl lactate, isopropyl myristate, myristyl myristate, isopropyl palmitate, isopropyl adipate, butyl stearate, decyl oleate, cholesterol isostearate, glycerol monostearate, glycerol distearate, glycerol tristearate, alkyl lactate, alkyl citrate and alkyl tartrate;
- g) essential oils such as fish oils, mentha, jasmine, camphor, white cedar, bitter orange peel, yru, turpentine, cinnamon, bergamont, citrus unshiu, calamus, pine, lavender, bay, clove, hiba, eucalyptus, lemon, starflower, thyme, peppermint, rose, sage, menthol, cineole, eugenol, citral, citronelle, borneol, linalool, geraniol, evening primrose, camphor, thymol, spirantol, pinene, limonene and terpenoid oils;
- h) lipids such as cholesterol, ceramides, sucrose esters and pseudo-ceramides as described in EP-A-556 957;

i) vitamins such as vitamins A and E, and vitamin alkyl esters, including vitamin C alkyl esters;

j) sunscreens such as octyl methoxyl cinnamate (Parsol (Trade Mark) MCX) and butyl methoxy benzoylmethane (Parsol (Trade Mark) 1789);

k) phospholipids; and

l) derivatives of alpha hydroxy acids such as materials of formula



wherein

R^1 is $C_pH_qN_rO_s$, where p is 0-20, q is 1-41, r is 0-3, and s is 0-3;

R^2 is C_tH_u where t is 0-20 and u is 1-41;

R^3 is $C_vH_wN_xO_y$ where v is 0-20, w is 1-41, x is 0-3 and y is 0-3 or a metallic, ammonium or alkanolammonium anion; and m is 1-10;

m) perfumes;

n) germicides such as synthetic antimicrobials examples of which include salicylic acid; 1,6 bis (N-p-chlorophenyl biguanido) hexane (Chlorhexidine); chlorhexidine gluconate; 2,4,4-trichloro-2-hydroxy diphenyl ether (Irgosan DP300); imidazolidinyl urea; methyl, propyl, butyl, heptyl and benzyl p hydroxy benzoate; 2-bromo 2-nitropropane-1,3-diol; nonyl phenol ethoxylate iodine complex; 2 phenoxy ethanol; 3- dimethylol-5, 5-dimethyl hydantoin; and natural antimicrobials examples of which include willow extract, neem tree extract; bamboo extract; and grapefruit extract;

o) mixtures of any of the foregoing components.

It is preferred if the skin benefit agent is perceived to condition the skin.

A particularly preferred skin benefit agent is a silicone.

Examples of preferred silicones are given in GB 1 549 180 (Procter & Gamble).

It is advantageous if the silicone is essentially a linear di(C_1 - C_5)alkylpolysiloxane or (C_1 - C_5)alkylarylpolysiloxane)

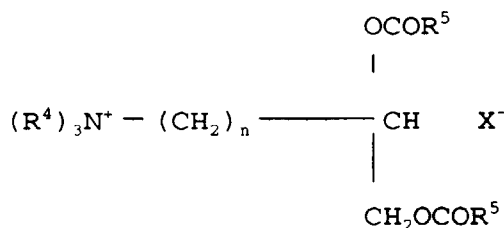
Examples of such silicones include the polydimethylsiloxanes.

A second class of preferred skin benefit agents comprises are long chain hydrocarbons and esters as disclosed in EP 0 000 406 (Procter & Gamble).

It is preferred if the level of skin benefit agent is from 1 to 25 wt% of the total composition, more preferably from 1 to 10 wt%.

Preferably the fabric conditioning composition for use with this invention comprises a fabric softening material. More preferably the fabric conditioning material is a quaternary ammonium softening material. Advantageously the fabric softening composition comprises a water insoluble cationic softening material which is a compound having two C_{12-28} alkyl or alkenyl groups connected to the N atom via one or more ester links.

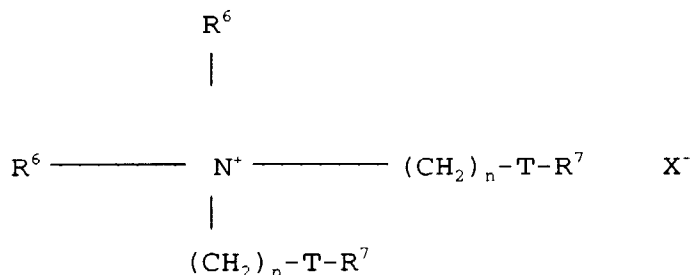
A preferred type of ester-linked quaternary ammonium fabric softening material for use in the compositions according to the invention can be represented by the formula:



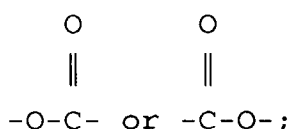
in which each R^4 group is independently selected from C_{1-4} alkyl, hydroxyalkyl groups or C_{2-4} alkenyl groups; and wherein each R^5 group is independently selected from C_{8-28} alkyl or alkenyl groups; X^- is any suitable anion and n is 0 or an integer from 1 to 5.

Materials of this class and their method of preparation are described in US 4 137 180 (Lever Brothers). Analysis of such materials shows that they also comprise small amounts of the corresponding dimethylamine salt, one such salt being N,N-dimethyl-2,3-bis[hardened tallowoyloxy]-propylamine hydrochloride. Advantageously 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.

A further preferred cationic softener is represented by the formula:



wherein each R^6 group is independently selected from C_{1-4} alkyl, hydroxyalkyl or C_{2-4} alkenyl groups; and wherein each R^7 group is independently selected from C_{8-28} alkyl or alkenyl groups; T is



and

n is 0 or an integer from 1 to 5 and X^- is any suitable anion.

A further advantage of using ester linked quaternary ammonium materials with the above formula is that included within a composition according to the invention the compositions have excellent viscosities and are stable on storage.

Preferably the level of ester linked quaternary ammonium compounds is at least 1% by weight of the composition, more preferably at least 3% by weight of the composition; especially interesting are concentrated compositions which comprise at least 7% of ester-linked quaternary ammonium compound. The level of ester-linked quaternary ammonium compounds preferably is from 1% to 80% by weight, more preferably from 4% to 32%, most preferably from 6% to 22%.

It is preferable if the ratio of fabric softening compound to skin benefit agent is from 5:1 to 1:5, more preferably from 4:1 to 2:3.

The softening composition may also comprise a nonionic stabilising agent selected from:

- i. linear C_8 to C_{22} alcohols alkoxyated with 10 to 20 moles of alkylene oxide; and
- ii. a C_{10} to C_{20} alcohol or mixtures thereof.

Advantageously the nonionic stabilising agent is a linear C₈ to C₂₂ alcohol alkoxyated with 10 to 20 moles of alkylene oxide. Preferably the nonionic stabiliser has an HLB value of from 10 to 20, more preferably from 12 to 20.

Preferably, the level of nonionic stabiliser is within the range from 0 to 10% by weight, more preferably from 0 to 5% by weight, most preferably from 0 to 4% by weight. When nonionic stabilising agent is present the mole ratio of the quaternary ammonium compound to the nonionic stabilising agent is within the range from 40:1 to about 1:1, preferably within the range from 18:1 to about 3:1.

Preferably the compositions of the invention are liquids comprising an aqueous base.

The composition can also contain a co-active, for example, a C₈ - C₂₄ alkyl or alkenyl monocarboxylic acid or polymer thereof. Preferably saturated fatty acid are used, in particular, hardened tallow (C₁₆-C₁₈) fatty acids. Preferably the fatty acid is non-saponified, for example free oleic acid, lauric acid or tallow fatty acid. Lanolin or other nonionic fabric softening agents may also be used as co-actives.

The level of co-active material is preferably more than 0.1% by weight, more preferably more than 0.2% by weight.

Especially preferred are concentrates comprising from 0.5 to 20% by weight of co-active, more preferably 1% to 10% by weight. The weight ratio of quaternary ammonium/amine material to co-active material is preferably from 10:1 to 1:10.

The composition can also contain one or more optional ingredients, selected from non-aqueous solvents, pH buffering agents, perfumes, perfume carriers, fluorescers, colourants, hydrotropes, antifoaming agents, soil release agents, enzymes, optical brightening agents, opacifiers, anti-shrinking agents, anti-spotting agents, germicides, fungicides, anti-oxidants, anti-corrosion agents, and antistatic agents.

The invention will now be illustrated by the following nonlimiting examples. In the examples all percentages are expressed by weight.

Examples

Rinse conditioner formulations according to table 1, were prepared by melting the cationic compound in the silicone fluid with rapid stirring, demineralised water at 70°C. Stirring was continued for 10-15 minutes prior to subjecting the mixture to high shear agitation using a Silverson homogeniser for 10-15 minutes.

Table 1

Example	A	1	2
HEQ ¹	5	4	4
PDMS 5000 cSt. ²		1	
PDMS 30,000 cSt. ²			1
Water and minors	to 100		

1. 1 is 1,2-bis[hardened tallowyloxy]-3-trimethylammonium propane chloride/hardened tallow fatty acid - 6:1 quat:fatty acid, ex Hoechst.

2. Polydimethylsiloxane silicone fluid, various viscosities, ex Dow Corning.

3. C₁₂ nonionic ethoxylated with 12 moles of ethylene oxide per molecule (Genapol C200, ex Hoechst).

Silicone Transfer

The formulations of the Examples were used to treat terry towelling at a dosage of 2ml/L in 1L tergotometer pots (liquor:cloth = 40:1, ambient temperature, 5 minutes., 65 rpm). The terry towelling was spun to remove excess liquor and then line dried.

The treated terry towelling pieces were rubbed onto the front forearms of the assessor for one minute. Three tape strip samples of the skin surface were taken and analysed for silicon by XRF spectrometry. Silicone levels were recorded in counts per second from S XRF spectrometry of the tape strips. Each figure represents the mean of three independent tape strip values.

Softening scores were obtained by comparison with previously prepared standards; on this scale standard 8 corresponds to untreated (harsh) terry and standard 2 corresponds to very soft terry.

Table 2

Treatment	Softening Score ²	S (CPS)
Example 1	3.75	80
Example 2	2.5	68

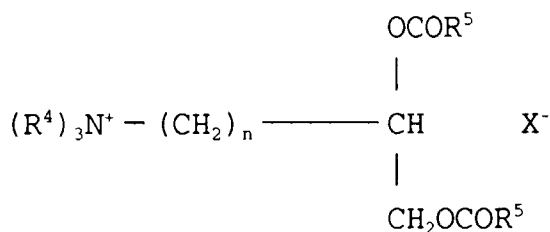
Table 2 (continued)

Treatment	Softening Score ²	S (CPS)
Example A	3	16

All of the formulations gave excellent softening of the terry towelling. In addition, the formulations of examples 1 and 3 were found to transfer a significant level of silicone onto the skin.

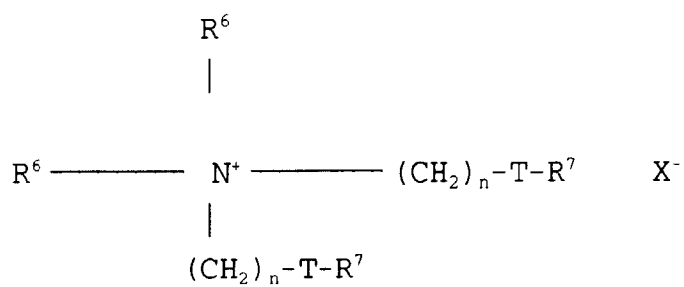
Claims

1. Use of a skin benefit agent as an ingredient in a fabric softening composition to enable the fabric softening composition to render textile fabrics treated with the composition capable of delivering the skin benefit agent to the skin with which the fabrics come into contact.
2. Use of a skin benefit agent according to claim 1 in which the skin benefit agent is a material providing sensory and/or cosmetic benefits to the skin.
3. Use of a skin benefit agent in a fabric softening composition to impart sensory and/or cosmetic benefits to the skin when fabrics treated with the composition come into contact with the skin.
4. Use of a skin benefit agent in a fabric softening composition according to any preceding claim wherein the skin benefit agent is a skin conditioning agent.
5. Use of a skin benefit agent in a fabric softening composition according to any preceding claim in which the skin benefit agent is a silicone.
6. Use of a skin benefit agent in a fabric softening composition according to any preceding claim in which the silicone is an essentially linear di(C₁₋₅)alkyl polysiloxane or (C₁₋₅) alkylarylpolysiloxane.
7. Use of a skin benefit agent in a fabric softening composition according to any preceding claim in which the level of skin benefit agent is from 1 to 25 wt% of the total composition.
8. Use of a skin benefit agent in a fabric softening composition according to any preceding claim in which the composition further comprises a quaternary ammonium fabric softening material.
9. Use of a skin benefit agent in a fabric softening composition according to claim 8 in which the quaternary ammonium fabric softening material in the composition is represented by the formula:

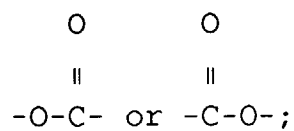


in which each R⁴ group is independently selected from C₁₋₄ alkyl, hydroxyalkyl groups or C₂₋₄ alkenyl groups; alkenyl groups; each R⁵ group is independently selected from C₈₋₂₈ alkyl or alkenyl groups; X⁻ is any suitable anion; and n is 0 or an integer from 1-5.

10. Use of a skin benefit agent in a fabric softening composition according to claim 8 in which the fabric softening quaternary ammonium material in the composition is represented by the formula:



wherein each R^6 group is independently selected from C_{1-4} alkyl, hydroxyalkyl or C_{2-4} alkenyl groups; and wherein each R^7 group is independently selected from C_{8-28} alkyl or alkenyl groups; T is



and
n is 0 or an integer from 1-5 and X^- is any suitable anion.



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EUROPEAN SEARCH REPORT

Application Number
EP 97 30 0495

DOCUMENTS CONSIDERED TO BE RELEVANT			
Category	Citation of document with indication, where appropriate, of relevant passages	Relevant to claim	CLASSIFICATION OF THE APPLICATION (Int.Cl.6)
X	US 4 110 498 A (BENJAMIN LAWRENCE ET AL) 29 August 1978 * column 6, line 33-39; claims 1-18 * ---	1-4,7,8	C11D3/00 C11D1/62
X,D	EP 0 436 729 A (KANEBO LTD) 17 July 1991 * page 7, line 30-57; claims 1-17 * ---	1-4	
X	US 4 134 838 A (HOOPER DAVID C ET AL) 16 January 1979 * column 3, line 59 - column 4, line 14; claims 1,12 * ---	1-3,8	
X	EP 0 659 877 A (CIBA GEIGY AG) 28 June 1995 * page 2, line 24 - page 3, line 4; claims 1-6; examples 3,4,6 * ---	3,8	
A	US 4 137 180 A (NAIK APPAYA R ET AL) 30 January 1979 * claim 1 * ---	9	
A	US 5 447 644 A (GUENIN ERIC P ET AL) 5 September 1995 * column 5, line 66 - column 6, line 41 * -----	10	TECHNICAL FIELDS SEARCHED (Int.Cl.6) C11D
The present search report has been drawn up for all claims			
Place of search THE HAGUE		Date of completion of the search 20 May 1997	Examiner Ainscow, J
CATEGORY OF CITED DOCUMENTS X : particularly relevant if taken alone Y : particularly relevant if combined with another document of the same category A : technological background O : non-written disclosure P : intermediate document		T : theory or principle underlying the invention E : earlier patent document, but published on, or after the filing date D : document cited in the application L : document cited for other reasons ----- & : member of the same patent family, corresponding document	

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