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(54) **FABRIC SOFTENING COMPOSITION**

TEXTILWEICHMACHERZUSAMMENSETZUNG

COMPOSITION ADOUCISSANTE POUR TISSUS

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- **DATABASE WPI Section Ch, Week 9121 Derwent Publications Ltd., London, GB; Class E17, AN 91-152271 XP002031795 & JP 03 086 798 A (LEGRIS KK) , 11 April 1991**
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Description

[0001] This invention relates to fabric softening compositions containing a skin benefit agent such that when fabrics are treated with the fabric softening composition when in contact with the skin the fabrics deliver the skin benefit agent to the skin

[0002] 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.

[0003] In addition to softening, fabric softening compositions desirably have other benefits.

[0004] GB 1 601 359 (Procter and Gamble) and GB 1 550 205 (Procter and Gamble) describes the use of ester oil and silicones as an ingredient in a fabric softening composition as fabric lubricants suggested which may give ease of ironing benefits, and softening.

[0005] EP 0 436 729 (Kanebo) discloses an industrial process for applying microcapsules to fabric, which when contacted with the skin are physiologically active.

[0006] Accordingly the present invention provides a fabric softening composition comprising a skin conditioning compound comprising a C₈-C₂₂ α-hydroxyacid, an ester of a α-hydroxyacid or mixtures thereof and a biodegradable, fabric softening quaternary ammonium compound as defined in claim 1.

[0007] In a second aspect of the present invention there is also provided the use of an α-hydroxyacid, or an ester thereof, in a fabric treatment composition such that skin is conditioned when fabrics treated with said composition come into contact with the skin.

[0008] It is preferred if the skin conditioning agent is an α-hydroxy carboxylic acid or ester or mixtures thereof. It is further preferred if the skin conditioning agent is represented by formula I:



[0009] In which R¹ is H or a C₁₀-C₂₂ acyl group and R² is H, a C₁₀-C₂₂ alkyl group, or a compatible counterion, for example sodium, potassium, or quaternary ammonium, R³ is hydrogen or C₁-C₂₀ alkyl group and m is equal to 1 or 10 with the proviso that if R¹ and R² are both hydrogen R³ is C₆- C₂₀ alkyl group.

[0010] Preferred α-hydroxyacids and esters for use with the invention may be represented by formula II and include glycollic acid esters, alkyl lactates, acyl lactylates, citric acid esters, tartaric acid esters, α-hydroxycaprylic acid esters, and long chain α-hydroxyacids (greater than or equal to 8 carbon atoms), for example α-hydroxycaprylic acid.



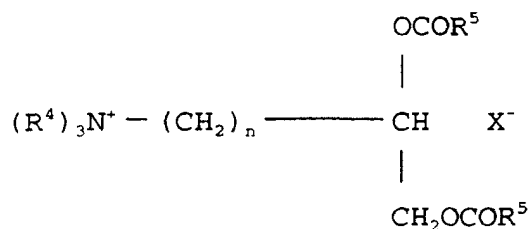
[0011] In which R¹ is H or a C₁₀-C₂₂ acyl group and R² is H, a C₁₀-C₂₂ alkyl group, or a compatible counterion, for example sodium, potassium, or quaternary ammonium, with the proviso that R¹ and R² cannot both be H.

[0012] It is especially preferred if the α-hydroxyacid ester is an alkyl lactate or acyl lactylate.

[0013] The level of acyl lactylate or alkyl lactate is preferably 5 to 30 wt%, most preferably 10 to 25wt% of the total composition.

[0014] Compositions according to the invention contain a quaternary ammonium fabric softeners compound. Advantageously the fabric softening composition comprises a water insoluble cationic compound having two C₁₂₋₂₈ alkyl or alkenyl groups. It is especially preferred if these C₁₂₋₂₈ alkyl or alkenyl groups are connected to the N atom via one or more ester links.

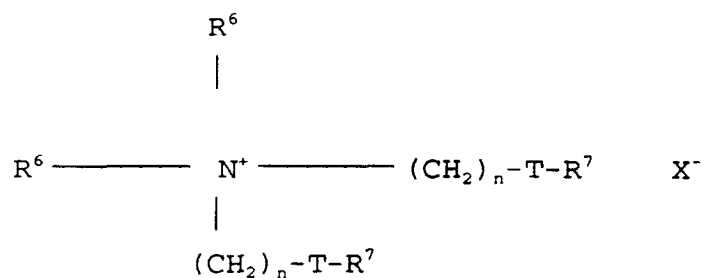
[0015] One type of ester-linked quaternary ammonium material used in the compositions according to the invention is represented by the formula:



[0016] In which each R⁴ group is independently selected from C₁₋₄ alkyl, hydroxyalkyl groups or C₂₋₄ alkenyl groups; wherein each R⁵ group is independently selected from C₈₋₂₈ alkyl or alkenyl groups; X⁻ is a suitable counter ion and n is 0 or an integer from 1-5.

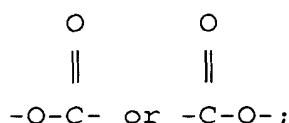
[0017] Materials of this class and their method of preparation are described in US 4 137 180 (Lever Brothers). Analysis of such materials shows that they also comprise small amounts of the corresponding dimethylamine salt, one such salt being N,N-dimethyl-2,3-bis[hardened tallowyloxy]-propylamine hydrochloride. Advantageously these materials comprise small amounts of the corresponding monoester as described in US 4 137 180, for example, 1-hardened tallowyloxy-2-hydroxy-3-trimethylammonium propane chloride.

[0018] A further type of cationic softener used in the composition according to the invention is represented by the formula:



wherein each R⁶ group is independently selected from C₁₋₄ alkyl, hydroxyalkyl or C₂₋₄ alkenyl groups; and wherein each R⁷ group is independently selected from C₈₋₂₈ alkyl or alkenyl groups;

T is



and

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

[0019] A further advantage of using ester linked quaternary ammonium materials with the above formula is that when fabric softening compositions containing them have excellent viscosities and are stable on storage.

[0020] 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%.

[0021] The ratio of fabric softening compound to acyl lactylate/alkyl lactate is preferably from 0.5:1 to 1:5, more preferably from 1:1 to 1:4.

[0022] The softening composition may also comprise a nonionic stabilising agent selected from:

i. linear C₈ to C₂₂ alcohol alkoxyated with 10 to 20 moles of alkylene oxide; and

ii. a C₁₀ to C₂₀ alcohol or mixtures thereof.

[0023] 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.

[0024] 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 1:1, preferably within the range from 18:1 to 3:1.

[0025] Preferably the compositions of the invention are liquids comprising an aqueous base.

[0026] The composition can also contain a co-active for example a C₈ - C₂₄ alkyl or alkenyl monocarboxylic acid or polymer thereof. Preferably saturated fatty acids 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.

[0027] 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.

[0028] 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.

[0029] The invention will now be illustrated by the following nonlimiting examples. In the examples all percentages are expressed by weight.

Example 1

[0030] A fabric softening composition comprising:

4.29 wt% quaternary ammonium cationic¹
 0.71 wt% fatty acid²
 15.00 wt% lauryl lactate³
 to 100 wt% water and minors

Example 2

[0031] A fabric softening composition comprising:

4.29 wt% quaternary ammonium cationic¹
 0.71 wt% fatty acid²
 10.00 wt% lauryl lactate³
 to 100 wt% water and minors

Preparation of Examples

[0032] The fabric softening compositions of the Examples were prepared by heating admixtures of cationic/fatty acid to above 70°C in lauryl lactate and slowly adding the mixture to hot demineralised water with vigorous shear.

[0033] A comparative example containing 4.29% quaternary ammonium cationic¹ and 0.71 wt% fatty acid² was prepared in a similar manner.

[0034] The Comparative Example and Example 1 were used to treat terry towelling in 1L tergotometer pots (liquor: cloth = 40:1, ambient temperature, 5 mins., 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 panellist for one minute. Tape

1 is 1,2 bis[hardened tallowoyloxy]-3-trimethylammonium propane chloride - ex Hoeschst
 2 is Hardened tallow fatty acid - ex Hoeschst
 3 is Crodamol LL - ex Croda

strips samples of the skin surface were taken and analysed for lactate content using a standard method involving Sigma 735-10 lactate reagent. The results are shown in the Table below and clearly illustrate the increased level of lactate found on using the formulation of Example 1.

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Example	Dosage (ml)	Lactate ($\mu\text{g}/\text{cm}^2$)
1	0.67	1.11
Comparative	2	0.43
1	1.33	0.95
Comparative	4	0.33

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15 **Claims**

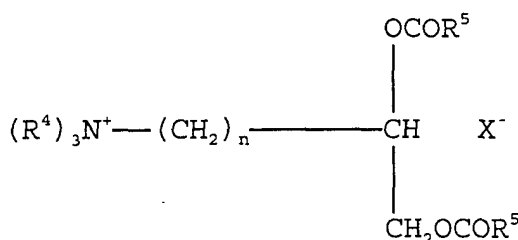
1. A fabric softening composition **characterised in that** it comprises:

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i) a skin conditioning compound comprising a $\text{C}_8\text{-C}_{22}$ α -hydroxyacid, an ester of a α -hydroxyacid or mixtures thereof and;

ii) a biodegradable, fabric softening quaternary ammonium compound represented by the formula:

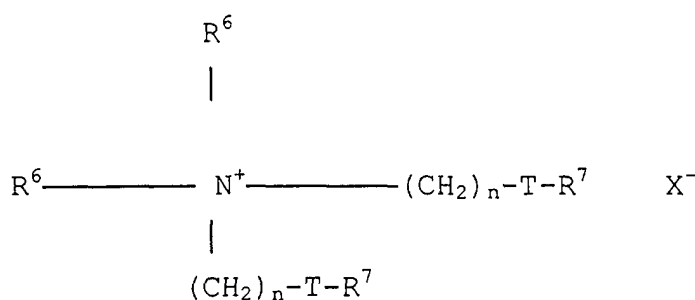
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in which each R^4 group is independently selected from C_{1-4} alkyl, hydroxyalkyl groups or C_{2-4} alkenyl groups; wherein each R^5 group is independently selected from C_{8-28} alkyl or alkenyl groups; X^- is a suitable counter ion and n is 0 or an integer from 1-5, or by the formula:

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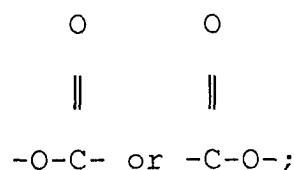
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wherein each R^6 group is independently selected from C_{1-4} alkyl, hydroxyalkyl or C_{2-4} alkenyl groups; and wherein each R^7 group is independently selected from C_{8-28} alkyl or alkenyl groups; T is

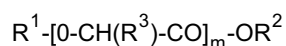
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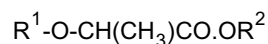
and n and X⁻ are as defined above.

2. A fabric softening composition according to claim 1 in which the skin conditioning agent is represented by the formula:



in which R¹ is H or a C₁₀-C₂₂ acyl group and R² is H, a C₁₀-C₂₂ alkyl group, or a compatible counterion, for example sodium, potassium, or quaternary ammonium, R³ is hydrogen or C₁-C₂₀ alkyl group and m is equal to 1 or 10 with the proviso that if R¹ and R² are both hydrogen R³ is C₆-C₂₀ alkyl group.

3. A fabric softening composition according to any preceding claim in which the skin conditioning compound is an acyl lactylate or an alkyl lactate or mixtures thereof.
4. A fabric softening composition according to any preceding claim in which the alkyl lactate or acyl lactylate has the following formula:



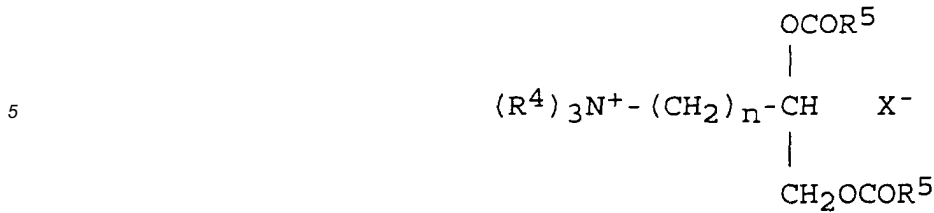
in which R¹ is H or a C₁₀-C₂₂ acyl group and R² is H, a C₁₀-C₂₂ alkyl group, or a compatible counterion, for example sodium, potassium, or quaternary ammonium, with the proviso that R¹ and R² cannot both be H.

5. A fabric softening composition according to any preceding claim in which the level of skin conditioning compound is from 5 to 30 wt%.
6. A fabric softening composition according to any preceding claim in which the ratio of fabric softening compound to skin conditioning compound is in the range from 1:1 to 1:5.
7. Use of an α-hydroxyacid or esters thereof in a fabric softening composition as defined in any preceding claim such that skin is conditioned when fabrics treated with the composition come into contact with the skin.
8. Use of an α-hydroxyacid ester in a fabric softening composition according to claim 7 in which the α-hydroxyacid ester is an alkyl lactate or an acyl lactylate.

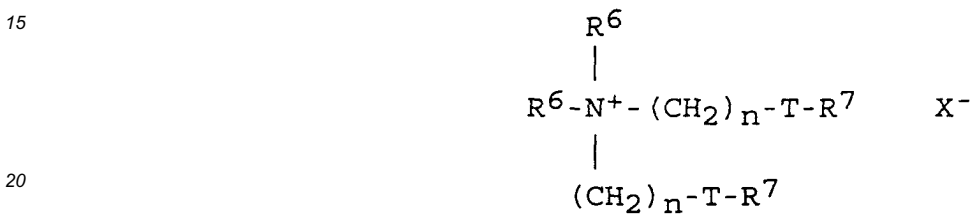
Patentansprüche

1. Textilweichmachende Zusammensetzung, **dadurch gekennzeichnet**, daß sie umfaßt:

- i) eine hautkonditionierende Verbindung, umfassend eine C₈-C₂₂-α-Hydroxysäure, einen Ester einer α-Hydroxysäure oder Gemische davon; und
 ii) eine bioabbaubare, textilweichmachende quaternäre Ammoniumverbindung, wiedergegeben durch die Formel:



10 worin jede Gruppe R⁴ unabhängig ausgewählt ist aus C₁₋₄-Alkyl-, Hydroxyalkylgruppen oder C₂₋₄-Alkenylgruppen; wobei jede Gruppe R⁵ unabhängig ausgewählt ist aus C₈₋₂₈-Alkyl- oder -Alkenylgruppen; X⁻ ein geeignetes Gegenion ist und n 0 oder eine ganze Zahl von 1-5 ist, oder durch die Formel:

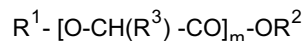


25 worin jede Gruppe R⁶ unabhängig ausgewählt ist aus C₁₋₄-Alkyl-, Hydroxyalkyl- oder C₂₋₄-Alkenylgruppen; und worin jede Gruppe R⁷ unabhängig aus C₈₋₂₈-Alkyl- oder -Alkenylgruppen ausgewählt ist;
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darstellt; und n und X⁻ wie vorstehend definiert sind.

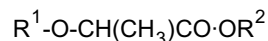
35 **2.** Textilweichmachende Zusammensetzung nach Anspruch 1, wobei das hautkonditionierende Mittel wiedergegeben wird durch die Formel:



40 worin R¹ H oder eine C₁₀-C₂₂-Acylgruppe darstellt und R² H, eine C₁₀-C₂₂-Alkylgruppe oder ein verträgliches Gegenion, beispielsweise Natrium, Kalium oder quaternäres Ammonium, darstellt, R³ Wasserstoff oder eine C₁-C₂₀-Alkylgruppe darstellt und m gleich 1 oder 10 ist, mit der Maßgabe, daß, wenn R¹ und R² beide Wasserstoff darstellen, R³ eine C₆-C₂₀-Alkylgruppe darstellt.

45 **3.** Textilweichmachende Zusammensetzung nach einem vorangehenden Anspruch, wobei die hautkonditionierende Verbindung ein Acyllactylat oder ein Alkylactat oder Gemische davon darstellt.

50 **4.** Textilweichmachende Zusammensetzung nach einem vorangehenden Anspruch, wobei das Alkylactat oder Acyllactylat die nachstehende Formel aufweist:



55 worin R¹ H oder eine C₁₀-C₂₂-Acylgruppe darstellt und R² H, eine C₁₀-C₂₂-Alkylgruppe oder ein verträgliches Gegenion, beispielsweise Natrium, Kalium oder quaternäres Ammonium, darstellt, mit der Maßgabe, daß R¹ und R² nicht beide H sein können.

5. Textilweichmachende Zusammensetzung nach einem vorangehenden Anspruch, wobei der Anteil an hautkondi-

tionierender Verbindung 5 bis 30 Gewichtsprozent ist.

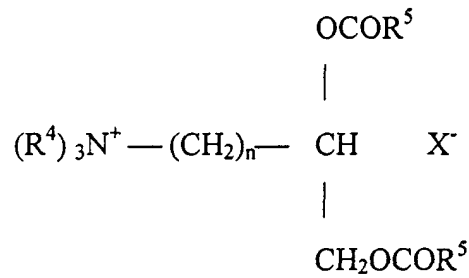
- 5 6. Textilweichmachende Zusammensetzung nach einem vorangehenden Anspruch, wobei das Verhältnis von textilweichmachender Verbindung zu hautkonditionierender Verbindung im Bereich von 1:1 bis 1:5 liegt.
7. Verwendung einer α -Hydroxysäure oder Estern davon in einer textilweichmachenden Zusammensetzung wie in einem vorangehenden Anspruch definiert, so daß die Haut konditioniert wird, wenn mit der Zusammensetzung behandelte Textilien mit der Haut in Kontakt kommen.
- 10 8. Verwendung eines α -Hydroxysäureesters einer textilweichmachenden Zusammensetzung nach Anspruch 7, worin der α -Hydroxysäureester ein Alkylactat oder ein Acyllactylat ist.

15 **Revendications**

1. Composition adoucissante pour tissus **caractérisée en ce qu'elle** comprend :

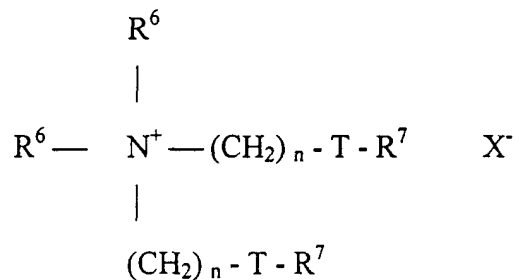
20 i) un composé adoucissant pour la peau comprenant un α -hydroxyacide en $C_8 - C_{22}$, un ester d'un α -hydroxyacide ou des mélanges de ceux-ci, et ;

25 ii) un composé biodégradable d'ammonium quaternaire adoucissant les tissus représenté par la formule :

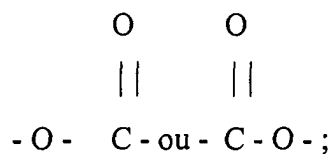


35 dans laquelle chaque groupe R^4 est indépendamment sélectionné parmi les groupes hydroxyalkyles, alkyles en $C_1 - C_4$ ou les groupes alkényles en $C_2 - C_4$; dans laquelle chaque groupe R^5 est indépendamment sélectionné parmi les groupes alkényles ou alkyles en $C_8 - C_{28}$; X^- est un ion antagoniste approprié et n est 0 ou un nombre entier compris entre 1 et 5, ou par la formule :

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55 dans laquelle chaque groupe R^6 est indépendamment sélectionné parmi les groupes alkyles en $C_1 - C_4$, hydroxyalkyles ou alkényles en $C_2 - C_4$; et dans laquelle chaque groupe R^7 est indépendamment sélectionné parmi les groupes alkyles en $C_8 - C_{28}$ ou alkényles ;
T est

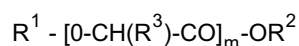


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10 et n et X⁻ sont comme défini ci-dessus.

2. Composition adoucissante pour tissus selon la revendication 1, dans laquelle l'agent adoucissant pour tissus est représenté par la formule :

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dans laquelle R¹ est H ou un groupe acyle en C₁₀ - C₂₂ et R² est H, un groupe alkyle compatible en C₁₀ - C₂₂ ou un ammonium quaternaire, ou un ion antagoniste compatible, par exemple du sodium, du potassium ou de l'ammonium quaternaire, R³ est de l'hydrogène ou un groupe alkyle en C₁ - C₁₀, m est égal à 1 ou 10 à condition que si R¹ et R² sont tous les deux de l'hydrogène, alors R³ est un groupe alkyle en C₆ - C₂₀.

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3. Composition adoucissante pour tissus selon l'une des revendications précédentes, dans laquelle le composé adoucissant pour tissus est un lactylate d'acyle ou un lactate d'alkyle ou des mélanges de ceux-ci.

4. Composition adoucissante pour tissus selon l'une des revendications précédentes, dans laquelle le lactate d'alkyle ou le lactylate d'acyle ont la formule suivante :

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dans laquelle R¹ est H ou un groupe acyle compatible en C₁₀ - C₂₂ et R² est H, un groupe alkyle en C₁₀ - C₂₂ ou un ion antagoniste compatible, par exemple de sodium, de potassium ou d'ammonium quaternaire, à la condition que R¹ et R² ne soient pas tous les deux H.

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5. Composition adoucissante pour tissus selon l'une des revendications précédentes, dans laquelle le niveau de composé adoucissant pour la peau est compris entre 5 et 30 % en masse.

6. Composition adoucissante pour tissus selon l'une des revendications précédentes dans laquelle le ratio entre le composé adoucissant pour tissus et le composé adoucissant pour la peau est compris dans 1 gamme allant de 1 pour 1 à 1 pour 5.

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7. Utilisation d'un α-hydroxyacide ou d'esters de celui-ci dans une composition adoucissante pour tissus selon l'une des revendications précédentes, de telle sorte que la peau soit adoucie lorsque les tissus traités avec ladite composition entrent en contact avec la peau.

8. Utilisation d'un ester d'α-hydroxyacide dans une composition adoucissante pour tissus selon la revendication 7, dans laquelle l'ester d'α-hydroxyacide est un lactate d'alkyle ou un lactylate d'acyle.

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