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(54) **FABRIC CONDITIONING COMPOSITION**

WÄSCHENACHBEHANDLUNGSMITTEL

COMPOSITION ADOUCISSANTE POUR TISSUS

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EP-A- 0 125 031

EP-A- 0 326 213

EP-A- 0 332 270

EP-A- 0 354 011

DE-A- 2 742 007

GB-A- 2 163 771

- **Römpp Lexikon Chemie - Version 2.0, Georg Thieme Verlag, Stuttgart (DE), 1999, entries "Betaine" and "Amphotenside"**

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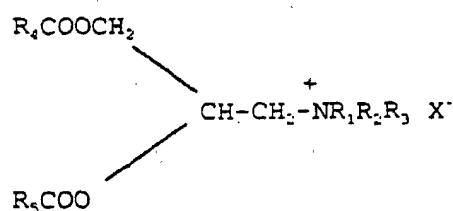
DescriptionField of the Invention

[0001] The present invention relates to a fabric conditioning composition, in particular the invention relates to aqueous dispersions of fabric conditioning compositions comprising a water insoluble quaternary ammonium material and a zwitterionic compound suitable for a rinse-added fabric softener compositions.

Background of the Invention

[0002] Rinse added fabric conditioning composition are known. Typically such compositions contain a water insoluble quaternary ammonium fabric softening agent dispersed in water at a level of softening agent up to about 7 wt%, in which case the compositions are considered dilute, or at levels from 7 wt% to 50 wt%, in which case the compositions are known as concentrates.

[0003] In US 4 137 180 (Lever Brothers Company) discloses cationic di-esters of the formula



wherein R_1 , R_2 and R_3 are each an alkyl or hydroxyalkyl group containing from 1 to 4 carbon atoms, or a benzyl group, R_4 and R_5 are each alkyl chains containing from 11 to 23 carbon atoms and X^- is a water soluble anion.

[0004] One of the problems associated with many fabric conditioning compositions including those containing cationic di-esters as disclosed in US 4 137 180 is the physical instability of these compounds, the problem is aggravated at high and low temperatures and by the addition of perfume. When a fabric conditioner is in concentrated form the stability issue is further exacerbated and for this reason concentrated conditioners with high levels of perfume are rarely marketed. Even when the perfume is encapsulated in a solid matrix, stability problems can occur due to leakage of the capsules.

[0005] A further problem that arises in colder climates is when a fabric conditioner is transported or stored in a cold place the product gels to form solid. In some cases the product does not recover and in others the time taken to thaw back to a liquid product frequently takes a couple of days. This poses a problem to supermarkets whom can not place the frozen product directly onto supermarket shelves.

[0006] EP 280 550 and EP 507 478 (Unilever) disclose the use of selected nonionic stabilising agents to overcome the poor stability. However no mention is made of the instability of the formulation when perfume is added.

[0007] US 3 984 335 (Ciko et al) discloses compositions containing a quaternised fatty amine and a fatty acid zwitterionic compound as a softening agent.

[0008] Zwitterionic softening agents such as amine oxides are disclosed in EP 0 332 270 (Unilever) in combination with cationic softening agents and an amine.

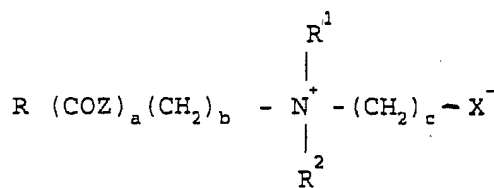
[0009] EP 0 326 213 discloses a fabric treatment composition comprising one or more water-soluble amphoteric fabric conditioning materials, preferably an amine oxide and a coactive material, the weight ratio of the amphoteric material to co-active being from 5:1 to 50:1. The co-active may be a cationic, nonionic or semi-polar surfactant.

[0010] The problem of forming a concentrated fabric conditioner with relatively high levels of perfume is mitigated by the present invention.

[0011] Furthermore the present invention aids recovery of a liquid fabric conditioner from a frozen state to a homogeneous liquid.

Description of the Invention

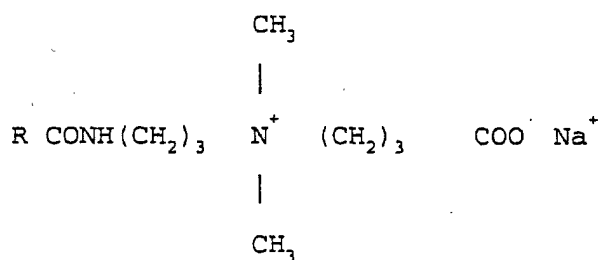
[0012] The present invention claims an aqueous dispersion of a fabric conditioning composition comprising greater than 7 wt% of a water insoluble biodegradable quaternary ammonium with at least one ester link, fabric softening agent, and between 0.5 wt% and 3.0 wt% of a perfume characterised in that the composition further comprises from 0.1 to 8 wt% of a zwitterionic compound of the formula:



wherein R is an C₇₋₂₇ alkyl or alkenyl group; R¹ and R² are independently selected from C₁₋₄ alkyl groups; a is an integer from 0 to 1; b and c are independently selected from integers from 1 to 4; Z is oxygen or nitrogen and X is a compatible anion.

[0013] At low pH's the anion may be protonated.

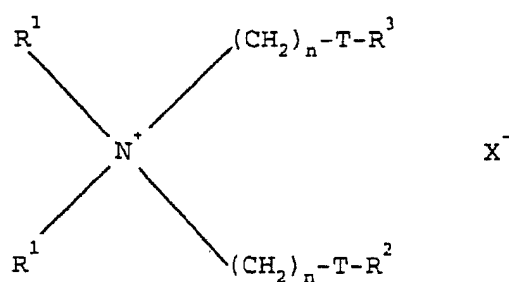
[0014] The invention also discloses the use of an alkyl amido propyl dimethyl amino acetic acid betaine of the formula:



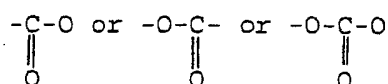
wherein R is a C₁₁₋₁₇ alkyl chain or mixtures thereof, to stabilise an aqueous dispersion of a perfumed fabric conditioner or to form an aqueous dispersion of a concentrated fabric conditioner, both comprising greater than 7 wt% of a fabric softening agent which is a water insoluble biodegradable quaternary ammonium with at least one ester link and between 0.5 wt% and 3.0 wt% of a perfume.

[0015] The cationic active used in the present invention comprises a water insoluble cationic fabric softening agent comprising a biodegradable quaternary ammonium material with at least one ester link. Preferred materials are water insoluble cationic fabric softening agents comprising a compound having two C₁₂₋₂₈ alkyl or alkenyl groups connected to a quaternary nitrogen via an ester link.

[0016] Of particular interest with the present invention are softening compounds having the formula:

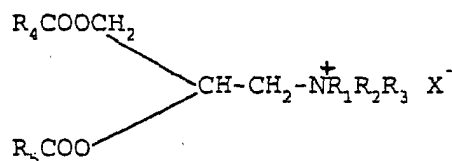


in which R¹ is a C₁₋₄ alkyl groups, R² and R³ are the same or different C₁₂₋₂₂ alkyl or alkenyl groups and T is the same or different.



groups and X^- is a water soluble anion.

[0017] It is especially preferred if the quaternary ammonium material is of the formula



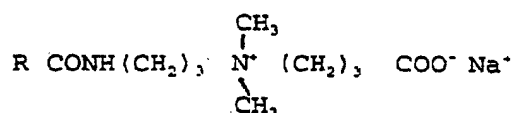
wherein R_1 , R_2 and R_3 are each an alkyl or hydroxyalkyl group containing from 1 to 4 carbon atoms, or an alkenyl with 2 to 4 carbon atoms, or a benzyl group, R_4 and R_5 are each alkyl chains containing from 6 to 28 carbon atoms and X^- is a water soluble anion.

[0018] It is further preferred if the water insoluble cationic active is N,N-dihardened(tallowoyl-oxy) N,N-trimethyl ammoniopropylamine chloride

[0019] Preferred materials and their method of preparation are described in US 4 137 180 (Lever Brothers). Preferably these materials comprise small amounts of the corresponding monoester as described in US 4 137 180 for example 1-tallow, 2-hydroxytrimethyl ammonium propylamine chloride.

[0020] The level of ester linked ammonium compound is above 7 % by weight of the composition; more preferably above 15% by weight of the composition; most preferably from 15% to 40% by weight of the composition.

[0021] It is advantageous if the zwitterionic material used in the present invention is an alkyl amido propyl dimethyl amino acetic acid betaine of the formula:



wherein R is a C_{11-17} alkyl chain or mixtures thereof.

[0022] The level of zwitterionic material is preferably from 0.1 wt% to 5 wt% of the composition; more preferably from 0.4 wt% to 5 wt% of the total composition.

[0023] The fabric conditioning composition may be formed from any base but it is especially preferred if the base is aqueous.

[0024] The composition may also contain long chain fatty acid material for example $C_8 - C_{24}$ alkyl or alkenyl monocarboxylic acids or polymers thereof. Preferably saturated fatty acids are used, in particular hardened tallow $C_{16} - C_{18}$ fatty acids. Preferably the fatty acid is non-saponified, more preferably the fatty acid is free for example oleic acid, lauric acid or tallow fatty acid.

[0025] The level of fatty acid material is preferably more than 0.1%, more preferably more than 0.2% by weight. Especially preferred are dilutes in which the fatty acid material is present from 0.25 wt% to 20 wt%. The weight ratio of quaternary ammonium compound to fatty acid material is preferably from 1:10 to 10:1.

[0026] The composition can also contain one or more optional ingredients, selected from the group consisting of nonaqueous solvents, pH buffering agents, perfume carriers, inorganic salts, fluorescers, colorants, hydrotopes, anti-foaming agents, antiredeposition agents, enzymes, optical brighteners, opacifiers, antishrinking agents, drape imparting agents, antistatic agents and ironing aids and concentrating agents such as glycerol monostearate.

[0027] It is also preferable if ethoxylated fatty alcohols are present in the composition. It is especially advantageous if they are present from 0.5 wt% to 2 wt% of the total composition.

[0028] The perfume may be encapsulated or free. The level of perfume in the product is between 0.5wt% and 3.0 wt%.

[0029] The composition may also contain nonionic fabric softening agents such as lanolin and derivatives thereof.

[0030] It is desirable if the viscosities of these fabric compositions lie in the range from 15 mPa.s to 120 mPa.s at a shear rate of $110s^{-1}$.

[0031] The compositions of the invention preferably have a pH of more than 2, more preferably between 2 and 5.

[0032] The invention will now be illustrated by the following nonlimiting examples.

EXAMPLES

[0033] In the examples all percentages are expressed by weight.

[0034] Comparative examples are represented by a letter while examples of the invention are represented by a number.

Preparation of Fabric Conditioning Composition

[0035] Liquid fabric softening agents were made up as follows:

[0036] The cationic fabric softening agent and non ionic stabilising agent were premixed and heated together to form a clear melt. The molten mixture thus formed was added over a period of at least one minute to water at ambient temperature with constant stirring to form a dispersion. Perfume was added to the aqueous mixture. Addition of the zwitterionic material occurred either

a) to the molten melt

b) to the aqueous mixture prior to or with the addition of the perfume.

Examples 1, 2, 3, A, B, C, D, E and F

[0037]

Table 1

Example Ingredients	% by weight									
	1	2	3	A	B	C	D	E	F	
HT TMAPC*	24.0	24.0	20	24.0	24.0	24.0	24.0	24	20	
Tego betaine L**	0.6	0.6	3.2	-	-	-	-	-	-	
Perfume	0.5	0.5	1.0	0.5	0.5	0.25	0.25	0.25	1.0	
Tallow alcohol 35EO	1.0	-	1.0	1.0	-	1.0	1.0	1.0	1.0	
Coco alcohol 20EO	-	1.0	-	-	1.0	-	1.0	-	-	
Calcium chloride	0.2	0.2	0.2	0.2	0.2	0.2	0.2	2.0	0.2	
Water	----- to 100 wt% -----									

[0038] HT TMAPC is 1,2 dihardened tallowyloxy trimethyl ammoniopropene chloride ex Hoescht.

[0039] Tego betaine L is Alkyl amido propyl dimethyl amino acetic acid betaine ex Shell.

[0040] The Examples were prepared according to method a) or b) above.

[0041] Examples A, B, E and F flocculated within 12 hours at ambient temperature Examples 1, 2, and 3 remained stable for several months at ambient temperature.

[0042] Storage results for Exmaples C and D were as follows:

Table 2

Example	Time taken for flocculation to occur.		
	37°C	45°C	20°C
C	4 weeks	1 day	3 months
D	4 weeks	1 day	3 months

Examples 4 and G

[0043]

Table 3

Composition	Example wt%	
	4	G
HT TMPAC	24	24
Tego betaine	0.6	-
Perfume	0.8	0.4
Tallow alcohol	1.0	1.0
Calcium chloride	0.2	0.2
Water	--- to 100 wt% ---	

[0044] Both Example 4 and Example G flocculated on addition of perfume. However Example 4 needed twice as much perfume to flocculate as Example G.

Example H

[0045]

Table 4

Composition	% wt
	Example H
Dihardened tallow dimethyl ammonium chloride	10.8
Dihardened tallow fatty acid	2.7
Ethylene glycol	9.0
Tallow alcohol 35 EO	1.0
Tego betaine	-
Water	-- to 100 --

[0046] Examples 1, 2, 4, A to D, G and H were frozen.

[0047] Examples 1, 2, and example 4 recovered from freezing within 1 to 2 hours.

[0048] Examples A to D and example recovered from freezing within 2 to 4 days.

[0049] Example H recovered from freezing within 4 hours.

[0050] It is thus demonstrated that the presence of a zwitterionic material aids recovery from freezing. The recovery from freezing is most enhanced with materials containing an ester link.

Example I

[0051]

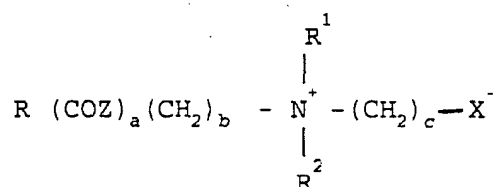
Table 5

Composition	% wt
	Example I
HT TMPAC	24
lauryldimethyl amine oxide	1
Perfume	0.5
Tallow alcohol 35EO	1.0
Calcium chloride	0.2
Water	--- to 100 wt% ---

[0052] Example I was prepared according to method a or b. Flocculation occurred within 1 week at room temperature no matter what method or preparation was used. It is thus shown that not all amphoteric compounds are suitable for use with this invention.

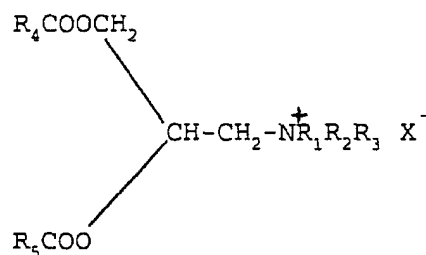
Claims

1. An aqueous dispersion of a fabric conditioning composition comprising greater than 7 wt% of a fabric softening agent which is a water insoluble biodegradable quaternary ammonium with at least one ester link between 0.5 wt% and 3.0 wt% of a perfume **characterised in that** the composition further comprises 0.1 to 8 wt% of a zwitterionic compound of the formula:



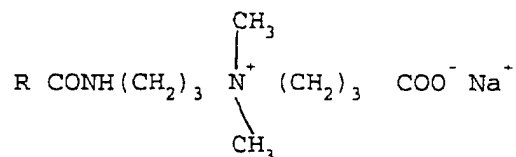
wherein R is an C₇₋₂₇ alkyl or alkenyl group; R¹ and R² are independently selected from C₁₋₄ alkyl groups; a is an integer from 0 to 1; b and c are independently selected from integers from 1 to 4; Z is oxygen or nitrogen and X is a compatible anion.

2. A fabric conditioning composition according to Claim 1 in which the biodegradable quaternary ammonium fabric softening agent comprises a compound having two C12-28 alkyl or alkenyl groups connected to a quaternary nitrogen via an ester link.
3. A fabric conditioning composition according to Claim 2 in which the biodegradable quaternary ammonium fabric softening agent is of the formula:



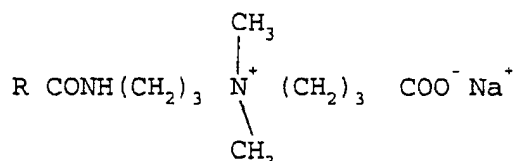
wherein R_1 , R_2 and R_3 are each an alkyl or hydroxyalkyl group containing from 1 to 4 carbon atoms, or an alkenyl with 2 to 4 carbon atoms, or a benzyl group, R_4 and R_5 are each alkyl chains containing from 8 to 28 carbon atoms and X is a water soluble anion.

4. A fabric conditioning composition according to any preceding claim in which the zwitterionic material is an alkyl amido propyl dimethyl amino acetic acid betaine of the formula:



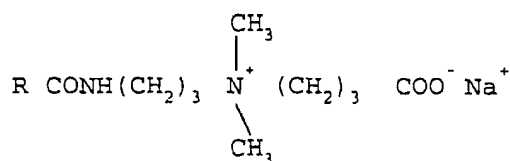
wherein R is a C_{11-17} alkyl chain or mixtures thereof.

5. A fabric conditioning composition according to any preceding claim in which the level of zwitterionic material is from 0.4 wt% to 5 wt%.
6. A fabric conditioner according to any preceding claim which comprises an aqueous base.
7. A composition according to any preceding claim which further comprises a fatty acid.
8. Use of an alkyl amido propyl dimethyl amino acetic acid betaine of the formula:



wherein R is a C_{11-17} alkyl chain or mixtures thereof, to stabilise an aqueous dispersion of a perfumed fabric conditioner comprising greater than 7 wt% of a fabric softening agent which is a water insoluble biodegradable quaternary ammonium with at least one ester link and between 0.5 wt% and 3.0 wt% of a perfume.

9. Use of an alkyl amido propyl dimethyl amino acetic acid betaine of the formula:

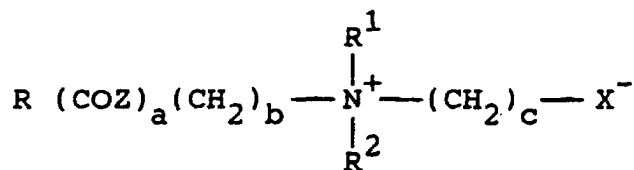


wherein R is a C_{11-17} alkyl chain or mixtures thereof, to form an aqueous dispersion of a concentrated fabric conditioner comprising greater than 7 wt% of a fabric softening agent which is a water insoluble biodegradable quaternary ammonium with at least one ester link and between 0.5 wt% and 3.0 wt% of a perfume.

Patentansprüche

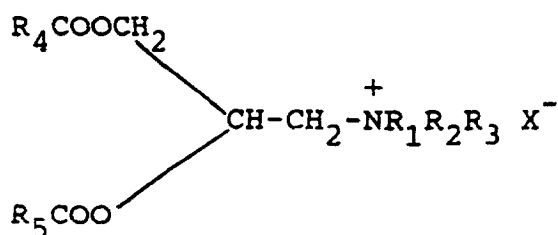
1. Eine wässrige Dispersion eines Wäschenaachbehandlungsmittels, enthaltend mehr als 7 Gewichtsprozent eines wäscheweichmachungsmittels, welches ein wasserunlösliches, biologisch abbaubares quaternäres Ammonium mit zumindest einer Esterbindung und zwischen 0,5 Gewichtsprozent und 3,0 Gewichtsprozent eines Parfüms ist,

dadurch gekennzeichnet, daß die Zusammensetzung ferner 0,1 bis 8 Gewichtsprozent einer zwitterionischen Verbindung der Formel



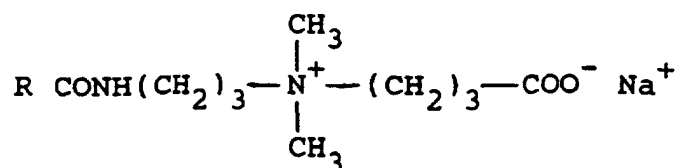
enthält, worin R eine C₇₋₂₇-Alkyl- oder -Alkenylgruppe ist; R¹ und R², unabhängig, aus C₁₋₄-Alkylgruppen ausgewählt sind; a eine ganze Zahl mit einem Wert von 0 bis 1 ist; b und c, unabhängig, aus ganzen Zahlen von 1 bis 4 ausgewählt sind; Z Sauerstoff oder Stickstoff ist und X ein verträgliches Anion ist.

2. Ein Wäschennachbehandlungsmittel nach Anspruch 1, in welchem das biologisch abbaubare quaternäre Ammonium-Wäscheweichmachungsmittel eine Verbindung mit zwei C₁₂₋₂₈-Alkyl- oder -Alkenylgruppen, verbunden mit einem quaternären Stickstoff über eine Esterbindung, enthält.
3. Ein Wäschennachbehandlungsmittel nach Anspruch 2, in welchem das biologisch abbaubare quaternäre Ammonium-Wäscheweichmachungsmittel ein solches der nachstehenden Formel



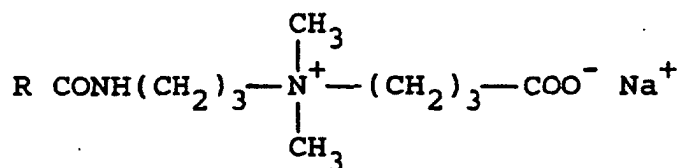
ist, worin jeder der Reste R₁, R₂ und R₃ eine Alkyl- oder Hydroxyalkylgruppe ist, enthaltend von 1 bis 4 Kohlenstoffatome, oder eine Alkenylgruppe mit 2 bis 4 Kohlenstoffatomen, oder eine Benzylgruppe, jeder Rest R₄ und R₅ Alkylketten sind, enthaltend von 8 bis 28 Kohlenstoffatome, und X ein wasserlösliches Anion bedeutet.

4. Ein Wäschennachbehandlungsmittel nach irgendeinem der vorstehenden Ansprüche, in welchem das zwitterionische Material ein Alkylamidopropyldimethylaminoessigsäure-Betain der Formel:



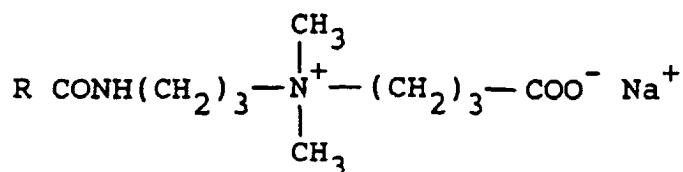
ist, worin R eine C₁₁₋₁₇-Alkylkette ist oder Mischungen derselben.

5. Ein Wäschennachbehandlungsmittel nach irgendeinem der vorstehenden Ansprüche, in welchem der Gehalt an zwitterionischem Material von 0,4 Gewichtsprozent bis 5 Gewichtsprozent beträgt.
6. Ein Wäschennachbehandlungsmittel nach irgendeinem der vorstehenden Ansprüche, welches eine wässrige Base enthält.
7. Eine Zusammensetzung nach irgendeinem der vorstehenden Ansprüche, welche ferner eine Fettsäure enthält.
8. Die Verwendung eines Alkylamidopropyldimethylaminoessigsäure-Betains der Formel:



worin R eine C₁₁₋₁₇-Alkylkette oder Mischungen derselben ist, zum Stabilisieren einer wässrigen Dispersion eines parfümierten Wäschennachbehandlungsmittels, enthaltend mehr als 7 Gewichtsprozent eines Wäscheweichmachungsmittels, welches ein wasserunlösliches, biologisch abbaubares quaternäres Ammonium mit zumindest einer Esterbindung ist, und zwischen 0,5 Gewichtsprozent und 3,0 Gewichtsprozent eines Parfüms.

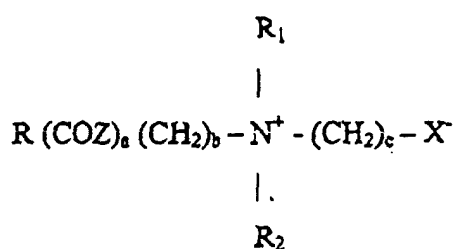
9. Die Verwendung eines Alkylamidopropyldimethylaminoessigsäure-Betains der Formel:



worin R eine C₁₁₋₁₇-Alkylkette oder Mischungen derselben ist, zur Bildung einer wässrigen Dispersion eines konzentrierten Wäschennachbehandlungsmittels, enthaltend mehr als 7 Gewichtsprozent eines Wäscheweichmachungsmittels, welches ein wasserunlösliches, biologisch abbaubares quaternäres Ammonium mit zumindest einer Esterbindung ist, und zwischen 0,5 Gewichtsprozent und 3,0 Gewichtsprozent eines Parfüms.

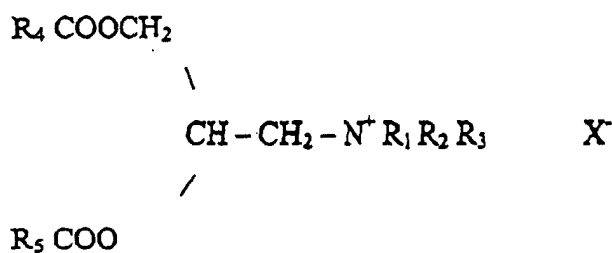
Revendications

1. Dispersion aqueuse d'une composition adoucissante pour tissus comprenant plus de 7 % en poids d'un agent adoucissant pour tissus qui est un ammonium quaternaire biodégradable non soluble dans l'eau avec au moins une liaison ester et entre 0,5 % en poids et 3,0 % en poids d'un parfum, **caractérisée en ce que** la composition comprend en outre de 0,1 à 0,8 % en poids d'un composé zwitterionique ayant la formule suivante :



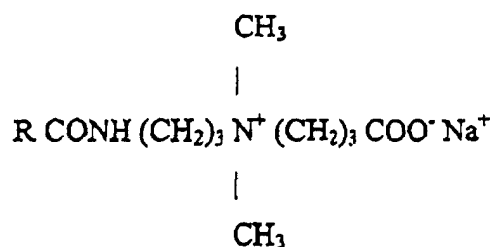
dans laquelle R est un groupe alkyle ou alkényle en C₇ - C₂₇ ; R₁ et R₂ sont indépendamment sélectionnés à partir des groupes alkyles en C₁-C₁₄ ; a est un nombre entier de 0 à 1 ; b et c sont indépendamment sélectionnés parmi les nombres entiers allant de 1 à 4 ; Z est un oxygène ou un azote et X est un anion compatible.

2. Composition adoucissante pour tissus selon la revendication 1, dans laquelle l'agent adoucissant pour tissus ammonium quaternaire biodégradable comprend un composé ayant deux groupes alkyles ou alkényles en C₁₂ - C₂₈, reliés à un azote quaternaire via une liaison ester.
3. Composition adoucissante pour tissus selon la revendication 2, dans laquelle l'agent adoucissant pour tissus ammonium quaternaire biodégradable a la formule suivante :



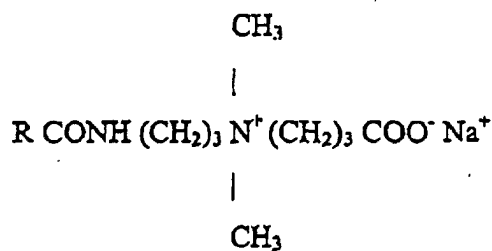
dans laquelle R_1 , R_2 et R_3 sont chacun un groupe alkyle ou hydroxyalkyle contenant de 1 à 4 atomes de carbone ou un groupe alkényle contenant de 2 à 4 atomes de carbone, ou un groupe benzyle ; R_4 et R_5 sont chacun des chaînes alkyles contenant de 8 à 28 atomes de carbone et X^- est un anion soluble dans l'eau.

4. Composition adoucissante pour tissus selon l'une quelconque des revendications précédentes dans laquelle le matériau zwitterionique est une bétaine d'acide alkyle amido diméthyle amino acétique ayant la formule suivante :



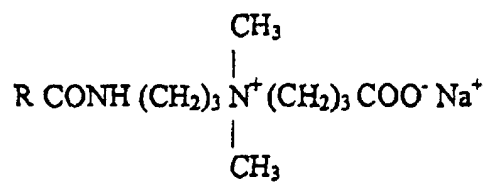
dans laquelle R est une chaîne alkyle en C_{11} - C_{17} ou un mélange de celles-ci.

5. Composition adoucissante pour tissus selon l'une quelconque des revendications précédentes dans laquelle le niveau de matériau zwitterionique est compris dans la gamme allant de 0,4 % en poids à 5 % en poids.
6. Composition adoucissante pour tissus selon l'une quelconque des revendications précédentes, comprenant une base aqueuse,
7. Composition adoucissante pour tissus selon l'une quelconque des revendications précédentes, comprenant en outre un acide gras.
8. Utilisation d'une bétaine d'acide alkyle amido propyle diméthyle amino acétique ayant la formule suivante :



dans laquelle R est une chaîne alkyle en C_{11} - C_{17} ou un mélange de celles-ci, pour stabiliser une dispersion aqueuse d'un adoucissant pour tissus parfumé.

9. Utilisation d'une bétaine d'acide alkyle amido propyle diméthyle amino acétique ayant la formule suivante :



dans laquelle R est une chaîne alkyle en C₁₁ - C₁₇ ou un mélange de celles-ci, pour former une dispersion aqueuse d'un adoucissant pour tissus concentré.