



(51) International Patent Classification:

C11D 1/62 (2006.01)

C11D 3/48 (2006.01)

C11D 3/00 (2006.01)

(21) International Application Number:

PCT/EP2024/063589

(22) International Filing Date:

16 May 2024 (16.05.2024)

(25) Filing Language:

English

(26) Publication Language:

English

(30) Priority Data:

23175416.9

25 May 2023 (25.05.2023)

EP

(71) Applicant (for all designated States except AE, AG, AU, BB, BH, BN, BW, BZ, CA, CL, CR, CY, DE, DJ, DM, DO, EC, EG, GB, GD, GH, GM, GT, HN, IE, IL, IN, IQ, IR, IT, JM, JO, KE, KH, KN, KR, KW, LA, LC, LK, LS, MA, MD, MT, MU, MW, MY, MZ, NA, NG, NI, NZ, OM, PA, PE, PG, QA, RS, RU, RW, SA, SC, SD, SG, SL, SV, SZ, TH, TN, TR, TT, TZ, UG, US, VC, VN, WS, ZA, ZM, ZW): **UNILEVER IP HOLDINGS B.V.** [NL/NL]; Weena 455, 3013 AL Rotterdam (NL).

(71) Applicant (for all designated States except AL, AO, AT, BA, BE, BF, BG, BJ, BR, CF, CG, CH, CI, CM, CN, CO, CU, CV, CZ, DK, DZ, EE, ES, FI, FR, GA, GE, GN, GQ, GR, GW, HR, HU, ID, IS, JP, KM, KP, LR, LT, LU, LV, LY, MC, ME, MG, MK, ML, MN, MR, MX, NE, NL, NO, PH, PL, PT, RO, SE, SI, SK, SM, SN, ST, SY, TD, TG, UA, US, UZ): **UNILEVER GLOBAL IP LIMITED** [GB/GB]; Port Sunlight, Wirral Merseyside CH62 4ZD (GB).

(71) Applicant (for US only): **CONOPCO, INC., D/B/A UNILEVER** [US/US]; 700 Sylvan Avenue, Englewood Cliffs, New Jersey 07632 (US).

(72) Inventors: **MJORNSTEDT, Sebastian Emanuel Aputsiaq**; Unilever Innovation Centre Wageningen B.V. Bronland 14, 6708 WH Wageningen (NL). **WELLS, John Francis**; Unilever Innovation Centre Wageningen B.V. Bronland 14, 6708 WH Wageningen (NL).

(74) Agent: **OATES, Elizabeth, Ellen**; Unilever Patent Group Bronland 14, 6708 WH Wageningen (NL).

(81) Designated States (unless otherwise indicated, for every kind of national protection available): AE, AG, AL, AM, AO, AT, AU, AZ, BA, BB, BG, BH, BN, BR, BW, BY, BZ, CA, CH, CL, CN, CO, CR, CU, CV, CZ, DE, DJ, DK, DM, DO, DZ, EC, EE, EG, ES, FI, GB, GD, GE, GH, GM, GT, HN, HR, HU, ID, IL, IN, IQ, IR, IS, IT, JM, JO, JP, KE, KG, KH, KN, KP, KR, KW, KZ, LA, LC, LK, LR, LS, LU, LY,

MA, MD, MG, MK, MN, MU, MW, MX, MY, MZ, NA, NG, NI, NO, NZ, OM, PA, PE, PG, PH, PL, PT, QA, RO, RS, RU, RW, SA, SC, SD, SE, SG, SK, SL, ST, SV, SY, TH, TJ, TM, TN, TR, TT, TZ, UA, UG, US, UZ, VC, VN, WS, ZA, ZM, ZW.

(84) Designated States (unless otherwise indicated, for every kind of regional protection available): ARIPO (BW, CV, GH, GM, KE, LR, LS, MW, MZ, NA, RW, SC, SD, SL, ST, SZ, TZ, UG, ZM, ZW), Eurasian (AM, AZ, BY, KG, KZ, RU, TJ, TM), European (AL, AT, BE, BG, CH, CY, CZ, DE, DK, EE, ES, FI, FR, GB, GR, HR, HU, IE, IS, IT, LT, LU, LV, MC, ME, MK, MT, NL, NO, PL, PT, RO, RS, SE, SI, SK, SM, TR), OAPI (BF, BJ, CF, CG, CI, CM, GA, GN, GQ, GW, KM, ML, MR, NE, SN, TD, TG).

Declarations under Rule 4.17:

- as to applicant's entitlement to apply for and be granted a patent (Rule 4.17(ii))
- as to the applicant's entitlement to claim the priority of the earlier application (Rule 4.17(iii))
- of inventorship (Rule 4.17(iv))

Published:

- with international search report (Art. 21(3))
- in black and white; the international application as filed contained color or greyscale and is available for download from PATENTSCOPE

(54) Title: LAUNDRY COMPOSITION

(57) Abstract: A transparent fabric conditioner composition comprising: quaternary ammonium compound and isothiazolinone derivatives.



LAUNDRY COMPOSITION

Field of the Invention

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The present invention relates to transparent fabric conditioners.

Background of the Invention

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Transparent fabric conditioners are desirable for some groups of consumers. However formulating transparent fabric conditioners is challenging. Quaternary ammonium compounds which are commonly used as fabric softening actives are inherently unstable, often leading to cloudy or hazy formulations. It is a challenge for formulators to produce a fabric softening composition which is stable, transparent and effective at softening fabrics. The addition of

15

preservatives to such formulations provides additional challenges for stability, particularly clarity.

Summary of the Invention

20

It has been found that by careful selection of the preservative, a stable transparent fabric conditioner can be produced.

Accordingly in a first aspect of the present invention is provided a transparent fabric conditioner comprising:

25

- a) Quaternary ammonium compound;
- b) Isothiazolinone derivatives.

30

In a further aspect of the present invention is provided a method of preserving a transparent fabric conditioner composition comprising a fabric softening active by the inclusion isothiazolinone derivatives.

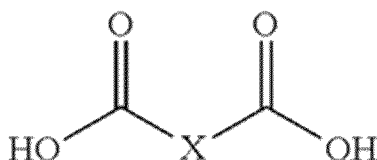
Detailed Description of the Invention

These and other aspects, features and advantages will become apparent to those of ordinary skill in the art from a reading of the following detailed description and the appended claims. For the avoidance of doubt, any feature of one aspect of the present invention may be utilised in any other aspect of the invention. The word “comprising” is intended to mean “including” but not necessarily “consisting of” or “composed of.” In other words, the listed steps or options need not be exhaustive. It is noted that the examples given in the description below are intended to clarify the invention and are not intended to limit the invention to those examples per se.

Similarly, all percentages are weight/weight percentages unless otherwise indicated. Except in the operating and comparative examples, or where otherwise explicitly indicated, all numbers in this description indicating amounts of material or conditions of reaction, physical properties of materials and/or use are to be understood as modified by the word “about”. Numerical ranges expressed in the format “from x to y” are understood to include x and y. When for a specific feature multiple preferred ranges are described in the format “from x to y”, it is understood that all ranges combining the different endpoints are also contemplated.

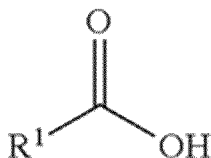
The compositions described herein comprise quaternary ammonium compounds. Preferably the quaternary ammonium compound comprises compounds obtained by reacting:

- i) a mixture of at least one dicarboxylic acid of formula (I)



Formula (I)

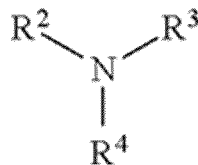
wherein X represents a saturated or unsaturated hydrocarbon residue having 1 to 8 carbon atoms, and at least one monocarboxylic acid of formula (II)



Formula (II)

wherein R¹ represents a saturated or unsaturated hydrocarbon residue having 5 to 21 carbon atoms, with

- ii) at least one tertiary amine of formula (III)



Formula (III)

wherein R², R³, and R⁴ independently represent a C₂ to C₆ hydroxyalkyl group, preferably 2-hydroxyethyl, and then reacting the resulting product with

- iii) at least one quaternizing agent for quaternizing at least one amino group contained in the reaction product.

In the dicarboxylic acid of formula (I), X preferably represents a group having 2 to 8 carbons, X preferably represents a hydroxy-substituted linear or branched alkyl or alkylene. More preferably, X represents ethan-1,2-diyl, propan-1,2-diyl, propan-1,3-diyl, butan-1,4-diyl, hexan-1,4-diyl, or cyclohexan-1,4-diyl, particularly preferably X represents butan-1,4-diyl. Even more preferably the dicarboxylic acid is selected from: succinic acid, maleic acid, glutaric acid, adipic acid and combinations thereof. Most preferably the dicarboxylic acid comprises adipic acid.

In the monocarboxylic acids of formula (II), R¹CO preferably represents an aliphatic, linear, or branched acyl residue having 6 to 22 carbon atoms. Preferably the monocarboxylic acid is selected from caproic acid, caprylic acid, 2-ethylhexanoic acid, capric acid, lauric acid, isotridecanoic acid, myristic acid, palmitic acid, palmoleic acid, stearic acid, isostearic acid, oleic acid, elaidic acid, petroselic acid, linoleic acid, linolenic acid, 2-octyldodecanoic acid, eleostearic acid, arachidic acid, gadoleic acid, behenic acid, erucic acid, coconut fatty acid, palm fatty acid, palm kernel fatty acid, tallow fatty acid and combinations thereof. Industrial mixtures thereof which are produced, for example, during the pressurized cleavage of natural fats and oils, during the reduction of aldehydes from the Roelen oxo synthesis, or the dimerization of unsaturated fatty acids may also be used. More preferably the monocarboxylic acid is selected

from: Stearic acid, isostearic acid, palmitic acid, myristic acid, lauric acid, capric acid, caprylic acid, 2-ethylhexanoic acid, 2-octyldodecanoic acid, caproic acid, oleic acid, linoleic acid, and linolenic acid, coconut fatty acid, palm fatty acid, palm kernel fatty acid, tallow fatty acid and combinations thereof.

5

Preferably the dicarboxylic acid of formula (I) is selected from: succinic acid, maleic acid, glutaric acid, adipic acid, and combinations thereof and the monocarboxylic acid of formula (II) is selected from: stearic acid, isostearic acid, palmitic acid, myristic acid, lauric acid, capric acid, caprylic acid, 2-ethylhexanoic acid, 2-octyldodecanoic acid, caproic acid, oleic acid, linoleic acid, linolenic acid, partially-hydrogenated coconut fatty acid, palm fatty acid, palm kernel fatty acid, tallow fatty acid and combinations thereof.

10

The alkanolamines of formula (III), preferably contain a hydroxyalkane residue (alkanol residue) having 2 to 6 carbon atoms, preferably 2 to 4 carbon atoms. Preferably the alkanolamines of formula (III) comprises triethanolamine.

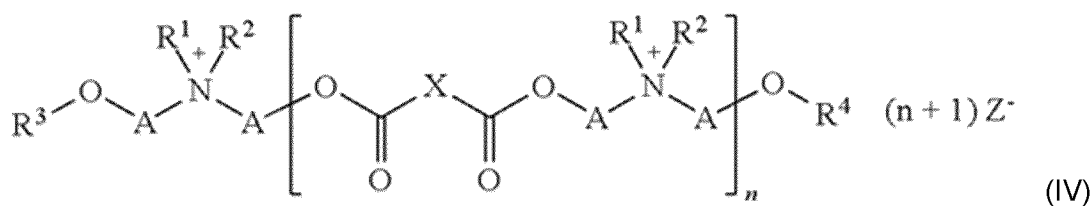
15

The monocarboxylic acids (of formula II) and the dicarboxylic acids (of formula I) may be used in the molar ratio of from about 1:10 to about 10:1. It has, however, proven advantageous to use a molar ratio of from about 1:1 to about 4:1 and, in particular, from about 1.5:1 to about 3:1. Manufacturing methods for preparing the esterquats used according to the present disclosure are generally known in the prior art. In particular, the method of preparation comprises the steps of esterification and quatanization.

20

In an especially preferred embodiment, the at least one cationic compound comprises or is composed of an esterquat compound of formula (IV)

25



wherein,

X is a saturated or unsaturated hydrocarbon residue having 1 to 10 carbon atoms preferably butan-1,4-diyl

30

A is a (C2 to C6) alkanediyl group, preferably ethan-1,2-diyl

R1 is a (C2 to C4) hydroxyalkyl group or a (C6 to C22) acyloxy (C2 to C4) alkyl group, preferably 2-hydroxyethyl or 2-((C6 to C22) acyloxy)ethyl;

R2 is methyl or ethyl;

5 R3 and R4-independently are a hydrogen atom or a (C6 to C22) acyl group;

n is 1 or 2; and

Z- is an anion, preferably methyl sulphate;

And wherein, at least one of the groups R1, R3, or R4 comprises a (C6 to C22) acyl residue.

10 The compositions described herein preferably comprise 1 to 80 wt.% fabric softening active by weight of the composition. More preferably 1.5 to 50 wt.% fabric softening active and even more preferably 2 to 20 wt.% fabric softening active by weight of the composition.

For the purposes of the present invention, transparency is measured by light transmission.

15 Preferably the formulation has a light transmission of 60 to 100%, more preferably 60 to 100%, even more preferably 70 to 100% and most preferably 80 to 90%. The light transmission is measured at 25°C and can suitably be measured using a Turbiscan®LAB ex. Formulation Scientific Instruments, with a 880 nm wavelength and a glass vials having a diameter of 25 mm and height of 55mm.

20

The compositions of the present invention comprise isothiazolinone derivatives. The isothiazolinone derivatives are preferably selected from: benzisothiazolinone (BIT), methylisothiazolinone (MIT), chloroisothiazolinone (CIT), or combinations thereof. Most preferably benzisothiazolinone (BIT). The compositions comprise 0.0001 to 1 wt.%

25 isothiazolinone derivatives by weight of the composition, preferably 0.001 to 0.5 wt.% and most preferably 0.005 to 0.2 wt.% by weight of the composition. More preferably the composition comprises 0.0001 to 1 wt.% benzisothiazolinone (BIT) by weight of the composition, more preferably 0.001 to 0.5 wt.% and most preferably 0.005 to 0.2 wt.% benzisothiazolinone (BIT) by weight of the composition.

30

The compositions described herein preferably comprise emulsifier. Preferably the compositions comprise 0.2 to 20 wt.% emulsifier by weight of the composition, more preferably 0.5 to 10 wt.% emulsifier and most preferably 0.7 to 5 wt.% emulsifier by weight of the composition.

The emulsifier preferably has an HLB value of at least about 12.0, preferably at least about 13.0, further preferably at least about 14.0, and most preferably at least about 15.0. The term "HLB" (hydrophilic-lipophilic balance) defines the hydrophilic and lipophilic components of corresponding classes of substances (which here are emulsifiers) in a range of values from about 1 to about 20 according to the following formula (Griffin, Classification of surface active agents by HLB, J. Soc. Cosmet. Chem. 1, 1949):

$$\text{HLB} = 20 \times (1 - (M1/M))$$

where M = molar mass of the entire molecule
and M1 = molar mass of the lipophilic component of the molecule

The emulsifier may be selected from:

- (i) the addition products of ethylene oxide and/or propylene oxide to linear fatty alcohols, fatty acids, alkyl phenols, alkylamines, or triglycerides. Preferably the fatty alcohols, fatty acids, alkyl phenols, alkylamines have a C 8 to 22 carbon chain;
- (ii) alkyl and/or alkenyl oligoglycosides having 8 to 22 carbon atoms in the alk(en)yl residue and ethoxylated analogs thereof;
- (iii) partial esters of glycerol and/or sorbitol with unsaturated, linear or saturated, branched fatty acids and/or hydroxycarboxylic acids, and adducts thereof with ethylene oxide;
- (iv) partial esters of polyglycerol, polyethylene glycol, trimethylolpropane, pentaerythritol, sugar alcohols, alkyl glucosides, and polyglucosides with saturated and/or unsaturated, linear or branched fatty acids and/or hydroxycarboxylic acids, and adducts thereof with ethylene oxide;
- (v) mixed esters of pentaerythritol, fatty acids, citric acid, fatty alcohol, methyl glucose and polyols,
- (vi) mono-, di- and trialkyl phosphates, and also mono-, di- and/or tri-PEG alkyl phosphates and salts thereof;
- (vii) lanolin alcohol;
- (viii) polysiloxane-polyalkyl-polyether copolymers and corresponding derivatives;
- (ix) polyalkylene glycols;
- (x) any combinations of ingredients (i) to (ix).

Preferably the emulsifier is selected from the addition products of ethylene oxide and/or propylene oxide to linear fatty alcohols, fatty acids, alkyl phenols, alkylamines, or triglycerides. Preferably the fatty alcohols, fatty acids, alkyl phenols, alkylamines have a C 8 to 22 carbon chain.

5

Preferably emulsifier comprises 6 to 100 moles of ethoxylation, more preferably 12 to 80, and even more preferably 20 to 60 moles of ethoxylation. Most preferably the emulsifier comprises about 40 moles of ethoxylation (i.e. 35 to 45 moles of ethoxylation).

- 10 Preferably the emulsifier is the addition product of a triglyceride. More preferably, the triglyceride is fully saturated. Full saturation may be naturally occurring or may be achieved by hydrogenation. Preferably the triglyceride chains comprise alcohol groups. Preferred sources of triglyceride are plant oils and combinations thereof. Preferably the triglycerides are sourced from the following oils: almond, argan, babassu, borage, camelina, canola, castor, chia, cherry,
- 15 coconut, corn, cotton, coffee, Cuphea Viscosissima, flax (linseed), grape, hemp, hepar, jatropha, jojoba, Lesquerella Fendleri, Moringa Oleifera, macadamia, mango, mustard, neem, olive, palm, palm kernal, perilla, rapeseed, safflower, sesame, shea, stillingia, soybean, sunflower, tonka bean, tung and combinations thereof. Most preferably castor oil.
- Most preferably the emulsifier comprises PEG-40 hydrogenated castor oil. The emulsifier
- 20 enhances the transparency of the formulations.

- The compositions described herein preferably comprise thickening agents. Preferably the thickening agents are selected from hydrophilic silicas, polysaccharides, polyethylene glycol monoesters and diesters of fatty acids, polyacrylates, polyacrylamides, polyvinyl alcohol,
- 25 polyvinylpyrrolidone, surfactants, electrolytes and combinations thereof.

- More preferably the thickening agent is selected from polymeric thickening agents, such as polysaccharides, polyethylene glycol monoesters and diesters of fatty acids, polyacrylates, polyacrylamides, polyvinyl alcohol, polyvinylpyrrolidone and combinations thereof.
- 30 Even more preferably the thickening agent is selected from non-ionic polymer, most preferably the thickening agent is selected from: hydroxyethyl cellulose (HEC), hydroxypropyl cellulose (HPC), hydroxypropyl methylcellulose (HPMC), methylcellulose (MC), guar, guar derivatives and mixtures thereof.

The compositions described herein preferably comprise 0.01 to 4 wt.% thickening agent by weight of the composition, more preferably 0.05 to 2 wt.% thickening agent.

5 The compositions of the present invention preferably comprises 0.1 to 30 wt. % perfume. More preferably the compositions comprise 0.5 to 20 wt.% perfume materials, even more preferably 1 to 15 wt.% perfume materials.

10 Useful perfume components may include materials of both natural and synthetic origin. They include single compounds and mixtures. Specific examples of such components may be found in the current literature, e.g., in Fenaroli's Handbook of Flavor Ingredients, 1975, CRC Press; Synthetic Food Adjuncts, 1947 by M. B. Jacobs, edited by Van Nostrand; or Perfume and Flavor Chemicals by S. Arctander 1969, Montclair, N.J. (USA). These substances are well known to the person skilled in the art of perfuming, flavouring, and/or aromatizing consumer products.

15 Particularly preferred perfume components are blooming perfume components and substantive perfume components. Blooming perfume components are defined by a boiling point less than 250°C and a LogP or greater than 2.5. Substantive perfume components are defined by a boiling point greater than 250°C and a LogP greater than 2.5. Boiling point is measured at standard pressure (760 mm Hg). Preferably a perfume composition will comprise a mixture of
20 blooming and substantive perfume components. The perfume composition may comprise other perfume components.

25 It is commonplace for a plurality of perfume components to be present in a free oil perfume composition. In the compositions for use in the present invention it is envisaged that there will be three or more, preferably four or more, more preferably five or more, most preferably six or more different perfume components. An upper limit of 300 perfume components may be applied.

30 In one aspect of the present invention is provided a method of preserving a transparent fabric conditioner. This method ensures that the transparency of the fabric conditioner formulation is maintained. The method involves the inclusion isothiazolinone derivatives in a transparent fabric conditioner as described herein.

Examples*Table 1: formulations*

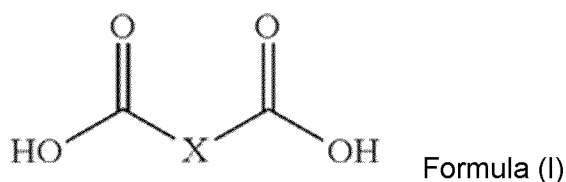
	Wt.% active			
	A	B	C	1
Quaternary ammonium compound according to formula (IV)	6.5	6.5	6.5	6.5
PEG-40 hydrogenated castor oil	0.5	0.5	0.5	0.5
DMDMH	0.2 %	-	-	-
Potassium sorbate	0.05 %	0.1 %	-	-
Lactic acid	-	0.1 %	0.1 %	-
Sodium benzoate	-	-	0.1 %	-
Benzisothiazolinone	-	-	-	0.008 %
Perfume	1.2	1.2	1.2	1.2
Hydroxyethyl cellulose	0.3	0.3	0.3	0.3
Minors	<1	<1	<1	<1
Water	To 100	To 100	To 100	To 100

- 5 The formulations were prepared by first preparing a pre-mix of the quaternary ammonium compound and the PEG 40 hydrogenated castor oil. Water was then heated to 65°C and the hydroxyethyl cellulose powder slowly added to the water with mixing. The minors and the preservative were then added, followed by the premix of quaternary ammonium compound and PEG 40 hydrogenated castor oil. Mixing continued and cool of the mixture started. The perfume
10 was added at 45°C. Finally, the mixture was cooled to room temperature.

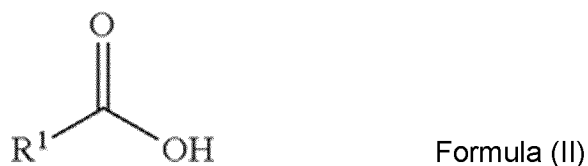
The samples were placed in clear vials and stored at 5°C and 40°C for 10 weeks. Images of these samples are provided in Figure 1 (5°C) and Figure 2 (40°C). Example 1 remained transparent, while the other samples became cloudy. This can be seen in figure 1 by the
15 visibility of the base of the sample pot. In figure 2 the same label was stuck to the base of the sample pots the label in Example 1 was significantly clearer than the labels in the other samples, demonstrating a significantly more transparent formulation.

Claims

- 1) A transparent fabric conditioner composition comprising:
 - a) quaternary ammonium compound;
 - b) isothiazolinone derivatives selected from: Benzisothiazolinone (BIT), Methylisothiazolinone (MIT), Chloroisothiazolinone (CIT), or combinations thereof.
- 2) A composition according to any preceding claim, wherein the isothiazolinone derivative is Benzisothiazolinone (BIT).
- 3) A composition according to any preceding claim, wherein the composition comprises 0.0001 to 1 wt.% isothiazolinone derivatives.
- 4) A composition according to any preceding claim, wherein the isothiazolinone is selected from benzisothiazolinone.
- 5) A composition according to any preceding claim, wherein the quaternary compound is obtained by reacting:
 - i) a mixture of at least one dicarboxylic acid of formula (I)

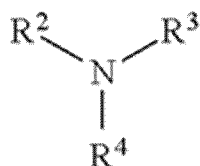


wherein X represents a saturated or unsaturated hydrocarbon residue having 1 to 8 carbon atoms, and at least one monocarboxylic acid of formula (II)



wherein R1 represents a saturated or unsaturated hydrocarbon residue having 5 to 21 carbon atoms, with

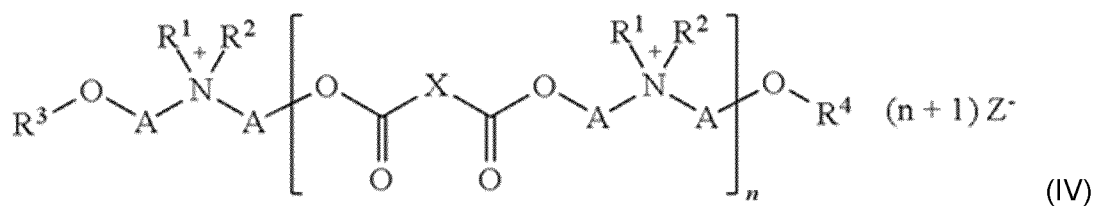
- ii) at least one tertiary amine of formula (III)



Formula (III)

wherein R^2 , R^3 , and R^4 independently represent a C_2 to C_6 hydroxyalkyl group, preferably 2-hydroxyethyl, and then reacting the resulting product with

- iii) at least one quaternizing agent for quaternizing at least one amino group contained in the reaction product.
- 6) A composition according to any preceding claim, wherein the quaternary ammonium compound has the formula:



wherein,

X is a saturated or unsaturated hydrocarbon residue having 1 to 10 carbon atoms;

A is a (C_2 to C_6) alkanediyl group;

R^1 is a (C_2 to C_4) hydroxyalkyl group or a (C_6 to C_{22}) acyloxy (C_2 to C_4) alkyl group;

R^2 is methyl or ethyl;

R^3 and R^4 -independently are a hydrogen atom or a (C_6 to C_{22}) acyl group;

n is 1 or 2; and

Z^- is an anion,

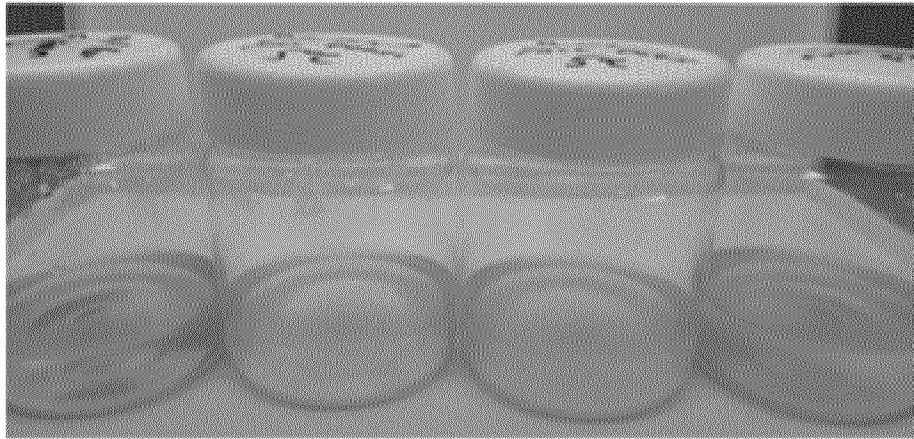
And wherein, at least one of the groups R^1 , R^3 , or R^4 comprises a (C_6 to C_{22}) acyl residue.

- 7) A composition according to any preceding claim, wherein the composition comprises 1 to 80 wt.% fabric softening active by weight of the composition.
- 8) A composition according to any preceding claim, wherein the composition comprises 0.2 to 20 wt.% emulsifier by weight of the composition.

- 9) A composition according to any preceding claim, wherein the composition comprises 0.01 to 4 wt.% thickening agent by weight of the composition.
- 10) A composition according to any preceding claim, wherein the composition comprises 0.1 to 30 wt. % perfume by weight of the composition.
- 11) A method of preserving a transparent fabric conditioner composition comprising a fabric softening active by the inclusion isothiazolinone derivatives.

Figure 1:

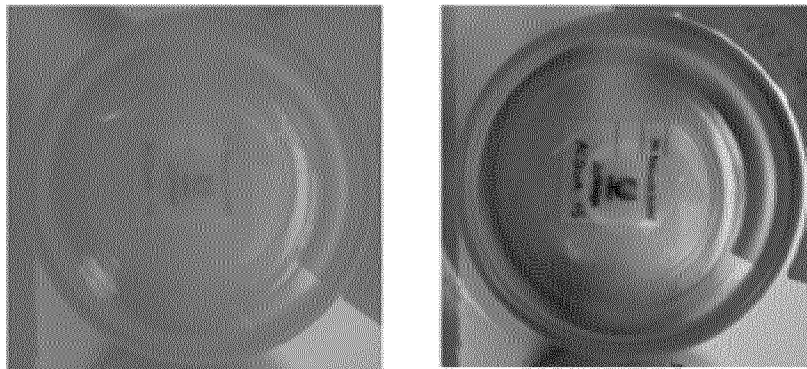
10 weeks 5°C



Example 1 Example A Example B Example C

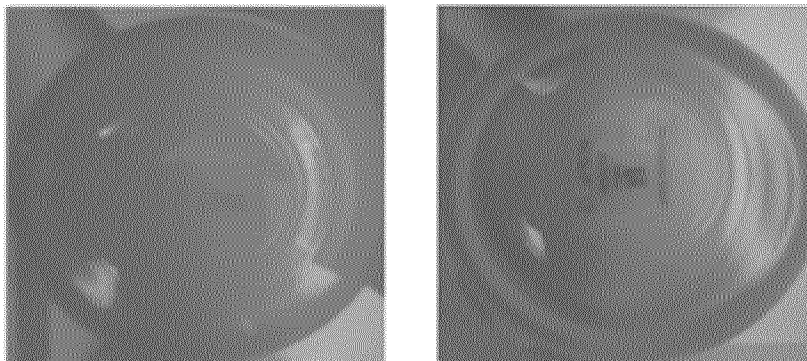
Figure 2:

10 weeks 40°C



Example A

Example 1



Example B

Example C

INTERNATIONAL SEARCH REPORT

International application No
PCT/EP2024/063589

A. CLASSIFICATION OF SUBJECT MATTER INV. C11D1/62 C11D3/00 C11D3/48 ADD.		
According to International Patent Classification (IPC) or to both national classification and IPC		
B. FIELDS SEARCHED Minimum documentation searched (classification system followed by classification symbols) C11D Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched Electronic data base consulted during the international search (name of data base and, where practicable, search terms used) EPO-Internal, WPI Data		
C. DOCUMENTS CONSIDERED TO BE RELEVANT		
Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	EP 0 305 065 A2 (CLOROX CO [US]) 1 March 1989 (1989-03-01)	11
A	Examples II and III; page 4, lines 44-45 -----	1-10
X	EP 1 392 806 B1 (RECKITT BENCKISER NV [NL]) 7 December 2005 (2005-12-07)	1-4,7, 9-11
Y	paragraphs [0048], [0049], Samples 5 and 6 -----	5,6,8
Y	US 2017/218304 A1 (SCHYMITZEK TATIANA [DE] ET AL) 3 August 2017 (2017-08-03) paragraphs [0235] - [0252], [0276] - [0299], Examples 1-3 -----	5,6,8
X	WO 2013/156371 A1 (UNILEVER PLC [GB]; UNILEVER NV [NL]; CONOPCO INC DBA UNILEVER [US]) 24 October 2013 (2013-10-24)	1-4,7-9, 11
Y	page 39, lines 6 to 13; Example 1 ----- -/-	5,6
☒ Further documents are listed in the continuation of Box C. ☒ See patent family annex.		
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Date of the actual completion of the international search 11 August 2024		Date of mailing of the international search report 28/08/2024
Name and mailing address of the ISA/ European Patent Office, P.B. 5818 Patentlaan 2 NL - 2280 HV Rijswijk Tel. (+31-70) 340-2040, Fax: (+31-70) 340-3016		Authorized officer Engelskirchen, S

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