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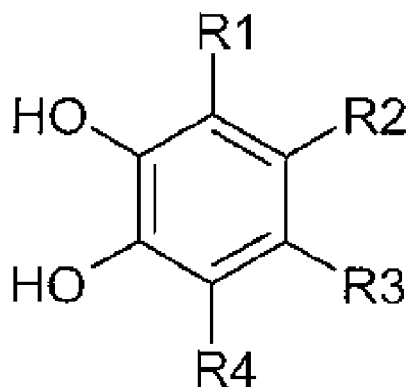
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(54) Title: COSMETIC TREATMENT PROCESS USING ORTHO-DIPHENOL DERIVATIVES, NOVEL COMPOUNDS AND COSMETIC COMPOSITION COMPRISING SAME



(I)

(57) Abstract: Cosmetic treatment process using ortho-diphenol derivatives, novel compounds and cosmetic composition comprising same The present invention relates to a cosmetic treatment process for keratin materials, in which a cosmetic composition comprising at least one compound of formula (I), or salts or solvates thereof, as defined hereinafter: is applied to said keratin materials. It is in particular a hair treatment process, in particular for damaged hair; preferably, it is a process for protecting and/or repairing the hair, in particular damaged hair. The invention also relates to certain novel compounds of formula (I) and to the cosmetic compositions comprising same.



WO 2012/038334 A1

Cosmetic treatment process using ortho-diphenol derivatives, novel compounds and cosmetic composition comprising same

5 The present invention relates to a cosmetic treatment process, especially for the hair, and in particular for protecting and/or repairing keratin fibres, especially damaged keratin fibres, said process using particular ortho-diphenol derivatives, especially comprising
10 fatty, PEG or silicone chains; the invention also relates to novel ortho-diphenol derivatives and also to the cosmetic compositions comprising same.

It is known that certain hair treatments, such as
15 dyeing or permanent-waving, can attack the hair fibre and especially bring about the loss of some of its constituents that are naturally present, in particular fatty acids. The hair products currently proposed do not, however, make it possible to relipidize in a long-
20 lasting manner the fibre thus damaged.

It is known, moreover, that the cosmetic qualities of the hair can be improved by applying compositions based on active agents that make it possible to confer
25 thereon various properties such as sheen, ease of disentangling, body, suppleness, liveliness or softness. In order to obtain good effectiveness, these active agents should of course exhibit, with respect to the keratin fibres, a certain affinity and also good
30 persistence. In other words, these active agents should, as far as possible, remain attached to the hair in a sufficient amount with a view to conferring thereon the desired properties.

35 With a view to improving the persistence of these active agents on the hair, a composition comprising lipids bearing functional groups, covalently bonded to the surface of the keratin materials, skin or hair, has in particular been proposed, for example by document

WO 2008/156327. The functional groups are very preferentially chosen from hydroxysuccinimidyl ester or maleimide groups, other functional groups, such as thiol or disulphide, also being mentioned. The lipids, for their part, are C8-C28, preferably branched, fatty acids.

One of the objectives of the present invention is to propose novel compounds capable of giving a damaged fibre back the physicochemical surface properties of a natural fibre, in a long-lasting manner. This can thus be referred to as relipidizing the fibre.

It can be considered that the compounds according to the invention, in particular those comprising a fatty chain, will enable the damaged fibre to return to a hydrophobic surface state close to that of the natural hair, in a long-lasting manner. The hair would thus be less sensitive to the changes in physicochemical properties brought about by the penetration of water into the hair fibre. The hair would then be more lively and less brittle. Its general appearance would be improved, the hair would be softer and more shiny.

Moreover, the compounds according to the invention could make it possible to improve the surface condition of keratin fibres, particularly in a humid environment.

A subject of the present invention is therefore a cosmetic treatment process for keratin materials, in which a cosmetic composition comprising at least one compound of formula (I), or salts or solvates thereof, as defined hereinafter, is applied to said keratin materials.

The invention also relates to certain novel compounds of formula (I') and to the cosmetic compositions comprising same.

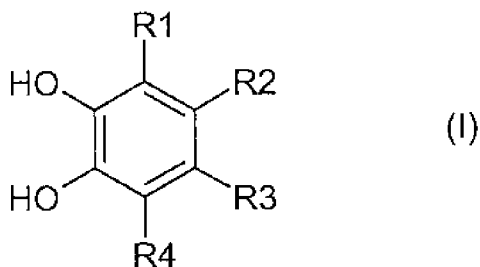
- 3 -

In particular, it is a hair treatment process, in particular for damaged hair; preferably, it is a process for protecting and/or repairing the hair, in particular damaged hair.

5

By virtue of the compounds according to the invention, it would be possible to improve the cosmetic appearance of hair that was damaged, for example following bleaching, permanent-waving, straightening, smoothing
10 or dyeing, or else naturally brittle hair, or alternatively hair attacked, for example, by UV radiation, pollution or repeated brushing. It would also be possible to give the hair body and/or liveliness and to make the surface thereof shiny; it
15 would also be possible to protect and/or repair damaged hair.

The compounds according to the invention therefore correspond to formula (I), and also salts and solvates
20 thereof:



in which R1 to R4, which may be identical or different,
25 denote:

- a hydrogen atom,
- a halogen,
- a carboxyl radical (COOH);
- a C1-C6 alkyl carboxylate radical (COOR);
- 30 - an NRR' radical with R and R', independently of one another, representing H or C1-C6 alkyl;
- a linear C1-C40 or branched C3-C40 alkyl radical (saturated), in which optionally one or more

- nonadjacent carbon atoms are replaced with a divalent radical chosen from: -NR₇, -S-, -O- and -C(O)- and combinations thereof, in particular such as -O-C(O)-, -C(O)-O-, -C(O)-NR₇-, -NR₇-C(O)- or -NR₇-C(O)-NR₇-;
- 5 and/or said alkyl radical being optionally substituted with one or more OH and/or with an aryl, itself optionally substituted with one or more radicals, which may be identical or different, chosen from C1-C6 alkyls and the radicals OH and NRR';
- 10
- a linear C2-C40 or branched C3-C40 (poly)alkenyl radical (one or more unsaturations), in which optionally one or more nonadjacent carbon atoms are replaced with a divalent radical chosen from: -NR₇, -S-
- 15 , -O- and -C(O)- and combinations thereof, in particular such as -O-C(O)-, -C(O)-O-, -C(O)-NR₇-, -NR₇-C(O)- or -NR₇-C(O)-NR₇-; and/or said alkenyl radical being optionally substituted with one or more OH and/or with an aryl, itself optionally substituted with one or
- 20 more radicals, which may be identical or different, chosen from C1-C6 alkyls and the radicals OH and NRR';
- an aryl group, optionally substituted with one or more C1-C30 alkyl radicals, in which optionally one or
- 25 more nonadjacent carbon atoms are replaced with a divalent radical chosen from: -NR₇, -S-, -O- and -C(O)- and combinations thereof, in particular such as -O-C(O)-, -C(O)-O-, -C(O)-NR₇-, -NR₇-C(O)- or -NR₇-C(O)-NR₇-;
- 30
- a silicone polymer radical of general formula -L-(Si(T)₂-O)_n-Si(T)₂-C_mH_{2m+1} in which T, which may be identical or different, is a C1-C20 alkyl group, preferably methyl or ethyl; or a C1-C20 alkylamino
- 35 group, in particular aminoethyl; or an iminopropyl group -(CH₂)₃-NH-(CH₂)₂-NH₂; or an aryl group, in particular phenyl; n, L and m are defined below; and in particular polyalkylsiloxane, polydiarylsiloxane such as diphenylsiloxanes, phenylmethylsiloxanes,

diphenylsiloxane/dimethylsiloxane copolymers, and phenylmethylsiloxane/dimethylsiloxane copolymers; or polyalkarylsiloxane, such as polymethylphenylsiloxanes; and preferably a radical $-L-(Si(CH_3)_2-O)_n-Si(CH_3)_2-C_mH_{2m+1}$ in which L, representing a linker between the catechol unit and the silicone chain, represents a saturated, linear C1-C40 or branched C3-C40, or unsaturated (having one or more C=C unsaturations) C2-C40 hydrocarbon-based chain; said chain being optionally interrupted with one or more groups chosen from: -O-, -C(O)-, -NH- and NR₇, and combinations thereof, in particular -C(O)O-, -OC(O)-, -C(O)NH-, -NHC(O)-, -NHC(O)NH- and -OC(O)O-; and/or said chain being optionally substituted with one or more groups chosen from -OR₅, -C(O)OR₅, -C(O)NHR₅ and -NR₆R₅, with R₅ and R₆, which may be identical or different, representing a hydrogen atom or a linear or branched C1-C6 alkyl radical; and n = 2 to 3500, in particular n = 2-150; and m = 1 to 6;

- a radical $-L-(O-(CH_2)_x)_p-O-CH_3$ in which L represents a saturated, linear C1-C40 or branched C3-C40, or unsaturated (having one or more C=C unsaturations) C2-C40 hydrocarbon-based chain; said chain being optionally interrupted with one or more groups chosen from: -O-, -C(O)-, -NH- and NR₇, and combinations thereof, in particular -C(O)O-, -OC(O)-, -C(O)NH-, -NHC(O)-, -NHC(O)NH- and -OC(O)O-; and/or said chain being optionally substituted with one or more groups chosen from: -OR₅-, -C(O)OR₅, -C(O)NHR₅ and -NR₆R₅, with R₅ and R₆, which may be identical or different, representing a hydrogen atom or a linear or branched C1-C6 alkyl radical; and x = 2 or 3 and p = 5 to 200;

- in all of these radicals, R₇ denoting a hydrogen atom or a C1-C6 alkyl radical, optionally substituted with one or more C1-C4 alkyls and/or OH;

- 6 -

it being understood that at least one of the radicals R1, R2, R3 and/or R4 is other than hydrogen.

Preferably, in formula (I), R1 = R2 = R3 = H or else R1
5 = R3 = R4 = H.

Preferably, in formula (I), the radical(s) R1 to R4 other than hydrogen are chosen from:

10 - a linear C2-C32, in particular C6-C30, or even C8-C28, or branched C3-C32, in particular C6-C30, or even C8-C28, alkyl radical (saturated), in which optionally one or more nonadjacent carbon atoms are replaced with a divalent radical chosen from -NR₇, -O-,
15 -OC(O)-, -C(O)O-, -C(O)NR₇- and -NR₇-C(O)-;

- a linear C2-C32, in particular C6-C30, or even C8-C28, or branched C3-C32, in particular C6-C30, or even C8-C28, (poly)alkenyl radical (one or more C=C
20 unsaturations, in particular one or two unsaturations), in which optionally one or more nonadjacent carbon atoms are replaced with a divalent radical chosen from: -NR₇, -O-, -OC(O)-, -C(O)O-, -C(O)NR₇- and -NR₇-C(O)-;

25 - a radical -L-(Si(CH₃)₂-O)_n-Si(CH₃)₂-C_mH_{2m+1} in which L represents a saturated linear C1-C30, in particular C6-C30, or even C8-C28, or unsaturated C2-C30, in particular C6-C30, or even C8-C28, hydrocarbon-based chain; optionally interrupted with
30 one or more groups chosen from: -O-, -C(O)-, -NH-, -C(O)O-, -C(O)NH- and -NHC(O)-; and/or optionally substituted with one or more -OH; and n = 2 to 3500, in particular 2 to 150, and m = 1 to 6;

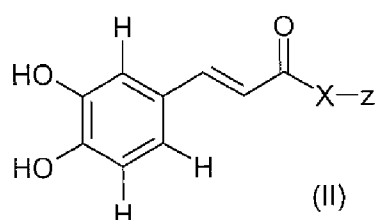
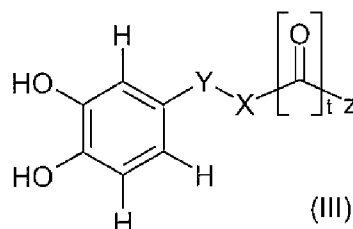
35 - a radical -L-(O-(CH₂)_x)_p-O-CH₃ in which L represents a saturated linear C1-C30, in particular C6-C30, or even C8-C28, or unsaturated C2-C30, in particular C6-C30, or even C8-C28,

hydrocarbon-based chain; optionally interrupted with one or more groups chosen from: -O-, -C(O)-, -NH-, -C(O)O-, -C(O)NH- and -NHC(O)-; and/or optionally substituted with one or more -OH;

5 and x = 2 or 3 and p = 5 to 200.

Preferentially, the compounds of the invention correspond to the following formula (II) or (III), and also salts and/or solvates thereof:

10



in which:

- X denotes -NR₈- or -O-, with R₈ = H or C1-C4 alkyl;

15

- Z denotes:

(i) a linear C1-C30 or branched C3-C30 alkyl radical, in which optionally one or more nonadjacent carbon atoms are replaced with a divalent radical chosen from: -NR₇, -S-, -O- and -C(O)- and combinations thereof, in particular such as -O-C(O)-, -C(O)-O-, -C(O)-NR₇-, -NR₇-C(O)- or -NR₇-C(O)-NR₇-; said radical being optionally substituted with one or more OH; R₇ denoting a hydrogen atom or a C1-C6 alkyl radical, optionally substituted with one or more C1-C4 alkyls and/or OH; or

20

25

(ii) a linear C2-C30 or branched C3-C30 (poly)alkenyl radical, in which optionally one or more nonadjacent carbon atoms are replaced with a divalent radical chosen from: -NR₇, -S-, -O- and -C(O)- and combinations thereof, in particular such as -O-C(O)-, -C(O)-O-, -C(O)-NR₇-, -NR₇-C(O)- or -NR₇-C(O)-NR₇-; said radical being optionally substituted with one or more OH; or

30

(iii) a radical $-L'-(\text{Si}(\text{CH}_3)_2\text{-O})_n\text{-Si}(\text{CH}_3)_2\text{-C}_m\text{H}_{2m+1}$, in which L' represents a saturated, linear C1-C30 or branched C3-C30, or unsaturated (having one or more unsaturations) C2-C30 hydrocarbon-based chain; said chain being optionally interrupted with one or more groups chosen from: $-\text{O}-$, $-\text{C}(\text{O})-$ and $-\text{NH}-$, and combinations thereof, in particular $-\text{C}(\text{O})\text{O}-$, $-\text{OC}(\text{O})-$, $-\text{C}(\text{O})\text{NH}-$ and $-\text{NHC}(\text{O})-$; said chain being optionally substituted with one or more OH; $n = 2$ to 3500 and $m = 1$ to 6;

(iv) a radical $-L'-(\text{O}-(\text{CH}_2)_x)_p\text{-O-CH}_3$, in which L' represents a saturated, linear C1-C30 or branched C3-C30, or unsaturated (having one or more unsaturations) C2-C30 hydrocarbon-based chain; said chain being optionally interrupted with one or more groups chosen from: $-\text{O}-$, $-\text{C}(\text{O})-$ and $-\text{NH}-$, and combinations thereof, in particular $-\text{C}(\text{O})\text{O}-$, $-\text{OC}(\text{O})-$, $-\text{C}(\text{O})\text{NH}-$ and $-\text{NHC}(\text{O})-$; said chain being optionally substituted with one or more OH; $x = 2$ or 3 and $p = 5$ to 200;

- $t = 0$ or 1;

- Y denotes a saturated linear C1-C10 or branched C2-C10 hydrocarbon-based chain.

Preferably, in formula (II):

- X = O or NH; and/or
- Z denotes:

(i) a linear C1-C22, in particular C4-C20, or branched C3-C22, in particular C4-C20, alkyl radical, in which optionally one or more nonadjacent carbon atoms are replaced with a divalent radical chosen from $-\text{NH}-$ and $-\text{O}-$ and combinations thereof; said radical being optionally substituted with one or more OH; or
(ii) a linear C2-C22, in particular C4-C20, or branched C3-C22, in particular C4-C20, (poly)alkenyl radical, in

which optionally one or more nonadjacent carbon atoms are replaced with a divalent radical chosen from -NH- and -O- and combinations thereof; said radical being optionally substituted with one or more OH; or

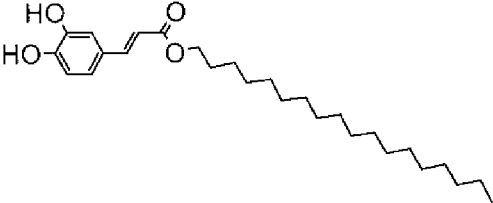
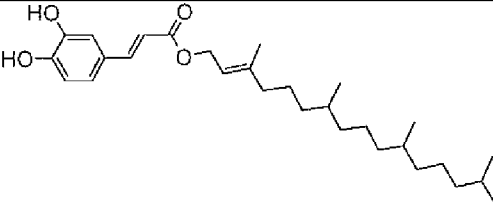
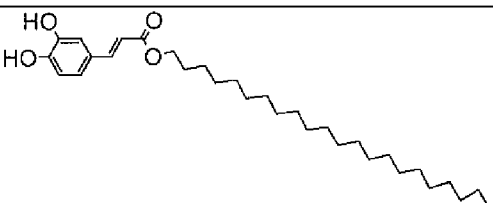
- 5 (iii) a radical $-L'-(\text{Si}(\text{CH}_3)_2\text{-O})_n\text{-Si}(\text{CH}_3)_2\text{-C}_m\text{H}_{2m+1}$, in which L' represents a saturated, linear C1-C12 or branched C3-C12, or unsaturated (having one or more unsaturations) C2-C12 hydrocarbon-based chain; said chain being optionally interrupted with one or more
- 10 groups chosen from: -O-, -NH-, -C(O)O-, -OC(O)-, -C(O)NH- and -NHC(O)-; said chain being optionally substituted with one or more OH; $n = 2$ to 3500, in particular 2 to 150, and $m = 1$ to 6, in particular 2 to 5; or
- 15 (iv) a radical $-L'-(\text{O}-(\text{CH}_2)_x)_p\text{-O-CH}_3$, in which L' represents a saturated, linear C1-C12 or branched C3-C12, or unsaturated (having one or more unsaturations) C2-C12 hydrocarbon-based chain, preferably saturated linear C1-C6 hydrocarbon-based
- 20 chain; $x = 2$ and $p = 5$ to 200.

Preferably, in formula (III):

- $X = \text{O}$ or NH ; and/or
- Y denotes a saturated linear C1-C4 hydrocarbon-based
- 25 chain, preferentially $-\text{CH}_2\text{-CH}_2-$; and/or
- Z denotes:
 - (i) a linear C1-C22, in particular C4-C20, or branched C3-C22, in particular C4-C20, alkyl radical, in which
 - 30 replaced with a divalent radical chosen from -NH- and -O- and combinations thereof; said radical being optionally substituted with one or more OH; or
 - (ii) a linear C2-C22, in particular C4-C20, or branched C3-C22, in particular C4-C20, (poly)alkenyl radical, in
 - 35 which optionally one or more nonadjacent carbon atoms are replaced with a divalent radical chosen from -NH- and -O- and combinations thereof; said radical being optionally substituted with one or more OH; or

- (iii) a radical $-L'-(\text{Si}(\text{CH}_3)_2\text{-O})_n\text{-Si}(\text{CH}_3)_2\text{-C}_m\text{H}_{2m+1}$, in which L' represents a saturated, linear C1-C12 or branched C3-C12, or unsaturated (having one or more unsaturations) C2-C12 hydrocarbon-based chain; said chain being optionally interrupted with one or more groups chosen from: $-\text{O}-$, $-\text{NH}-$, $-\text{C}(\text{O})\text{O}-$, $-\text{OC}(\text{O})-$, $-\text{C}(\text{O})\text{NH}-$ and $-\text{NHC}(\text{O})-$; said chain being optionally substituted with one or more OH; $n = 2$ to 3500, in particular 2 to 150, and $m = 1$ to 6, in particular 2 to 5; or
- (iv) a radical $-L'-(\text{O}-(\text{CH}_2)_x)_p\text{-O-CH}_3$, in which L' represents a saturated, linear C1-C12 or branched C3-C12, or unsaturated (having one or more unsaturations) C2-C12 hydrocarbon-based chain, preferably saturated linear C1-C6 hydrocarbon-based chain; $x = 2$ and $p = 5$ to 200.

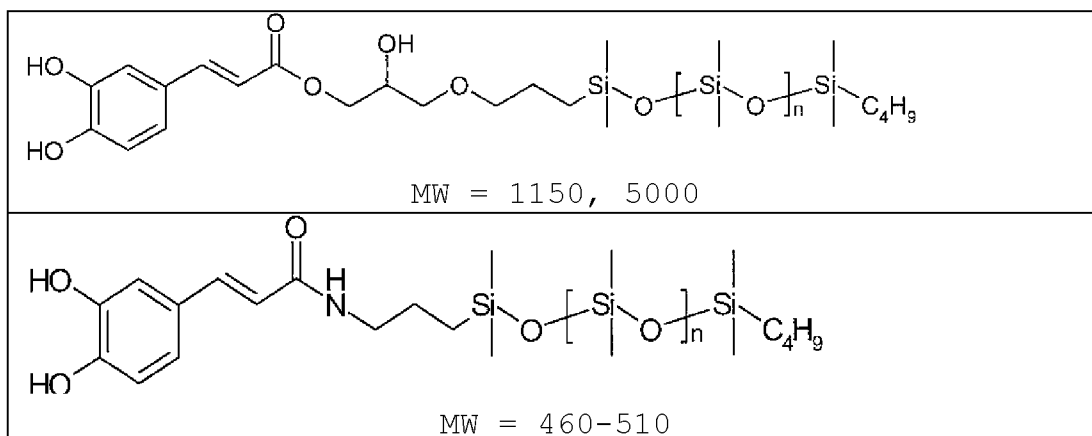
Among the compounds corresponding to formula (I), mention may be made of the following compounds, and also salts and/or solvates thereof:

Compound	Name
	octadecyl (2E)-3-(3,4-dihydroxyphenyl)prop-2-enoate
	(2E)-3,7,11,15-tetramethylhexadec-2-en-1-yl (2E)-3-(3,4-dihydroxyphenyl)prop-2-enoate
	docosyl (2E)-3-(3,4-dihydroxyphenyl)prop-2-enoate

	(2E)-3-(3,4-dihydroxyphenyl)-N-octadecylprop-2-enamide
	(2E)-3-(3,4-dihydroxyphenyl)-N-docosylprop-2-enamide
	N-[2-(3,4-dihydroxyphenyl)ethyl]-hexadecanamide
	N-[2-(3,4-dihydroxyphenyl)ethyl]-octadecanamide
	N-[2-(3,4-dihydroxyphenyl)ethyl]-docosanamide

n=10 (PEG 500)	PEG5000

	MW = 1600
	MW = 750, 1150, 5000, 10 000
	MW = 1150, 5000
	MW = 1150, 5000, 10 000



A mixture of compounds of formula (I) can quite obviously be used.

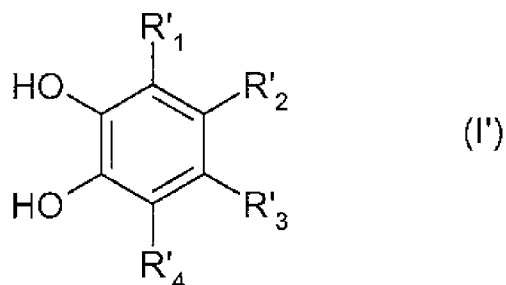
- 5 The salts and solvates of the compounds of formula (I) also form part of the present invention.

The salts comprise the conventional nontoxic salts of said compounds, such as those formed from organic or inorganic acids. Mention may be made of the salts of inorganic acids, such as sulphuric acid, hydrochloric acid, hydrobromic acid, hydriodic acid, phosphoric acid or boric acid. Mention may also be made of the salts of organic acids, which can comprise one or more carboxylic, sulphonic or phosphonic acid groups. They may be linear, branched or cyclic aliphatic acids or else aromatic acids. These acids may also comprise one or more heteroatoms chosen from O and N, for example in the form of hydroxyl groups. Mention may in particular be made of propionic acid, acetic acid, terephthalic acid, citric acid and tartaric acid. Among the salts of organic or inorganic bases, mention may be made of the triethanolamine, amidopropanediol, sodium, zinc or calcium salts. The cosmetically acceptable solvates of the compounds according to the invention comprise conventional solvates such as those formed during the final step of preparation of said compounds owing to the presence of solvents. Mention may be made of the solvates owing to the presence of water or of linear or branched alcohols such as ethanol or isopropanol.

Some of the compounds of formula (I) are novel and form a subject as such of the present invention.

- 5 The cosmetic compositions comprising, in a cosmetically acceptable medium, at least one such novel compound form another subject of the invention.

Some novel compounds correspond to the following
10 formula (I'), the salts and solvates thereof being included:



- 15 in which R'1 to R'4, which may be identical or different, denote:

- a hydrogen atom, or
- a silicone polymer radical of general formula
20 $-L-(Si(T)_2-O)_nSi(T)_2-C_mH_{2m+1}$ in which T, which may be identical or different, is a C1-C20 alkyl group, preferably methyl or ethyl; or a C1-C20 alkylamino group, in particular aminoethyl; or an iminopropyl group $-(CH_2)_3-NH-(CH_2)_2-NH_2$; or an aryl group, in
25 particular phenyl; n, L and m are defined below;
in particular a radical $-L-(Si(CH_3)_2-O)_nSi(CH_3)_2-C_mH_{2m+1}$ in which L represents a saturated, linear C1-C40 or branched C3-C40, or unsaturated C2-C40 hydrocarbon-based chain; said chain being optionally interrupted
30 with one or more groups chosen from: $-O-$, $-C(O)-$, $-NH-$ and NR_7 , and combinations thereof, in particular $-C(O)O-$, $-OC(O)-$, $-C(O)NH-$, $-NHC(O)-$, $-NHC(O)NH-$ and $-OC(O)O-$; and/or said chain being optionally

- 14 -

substituted with one or more groups chosen from $-OR_5$, $-C(O)OR_5$, $-C(O)NHR_5$ and $-NR_6R_5$, with R_5 and R_6 , which may be identical or different, representing a hydrogen atom or a linear or branched C1-C6 alkyl radical; and $n = 2$ to 3500, in particular 2-150; and $m = 1$ to 6;

- a radical $-L-(O-(CH_2)_x)_p-O-CH_3$
 in which L represents a saturated, linear C1-C40 or branched C3-C40, or unsaturated C2-C40 hydrocarbon-based chain; said chain being optionally interrupted with one or more groups chosen from $-O-$, $-C(O)-$, $-NH-$ and NR_7 , and combinations thereof, in particular $-C(O)O-$, $-OC(O)-$, $-C(O)NH-$, $-NHC(O)-$, $-NHC(O)NH-$ and $-OC(O)O-$; and/or said chain being optionally substituted with one or more groups chosen from $-OR_5$, $-C(O)OR_5$, $-C(O)NHR_5$ and $-NR_6R_5$, with R_5 and R_6 , which may be identical or different, representing a hydrogen atom or a linear or branched C1-C6 alkyl radical; and $x = 2$ or 3 and $p = 5$ to 200;

with R_7 denoting a hydrogen atom or a C1-C6 alkyl radical, optionally substituted with one or more C1-C4 alkyls and/or OH;

it being understood that at least one of the radicals $R'1$, $R'2$, $R'3$ and/or $R'4$ is other than hydrogen.

Preferably, in formula (I'), $R'1 = R'2 = R'3 = H$ or else $R'1 = R'3 = R'4 = H$.

Preferably, in formula (I'), the radical(s) $R'1$ to $R'4$ other than hydrogen is (are) chosen from:

- a radical $-L-(Si(CH_3)_2-O)_n-Si(CH_3)_2-C_mH_{2m+1}$
 in which L represents a saturated, linear C1-C30, in particular C6-C30, or even C8-C28, or unsaturated C2-C30, in particular C6-C30, or even C8-C28, hydrocarbon-based chain; optionally interrupted with one or more groups chosen from: $-O-$, $-C(O)-$, $-NH-$, $-C(O)O-$, $-C(O)NH-$ and $-NHC(O)-$; and/or optionally

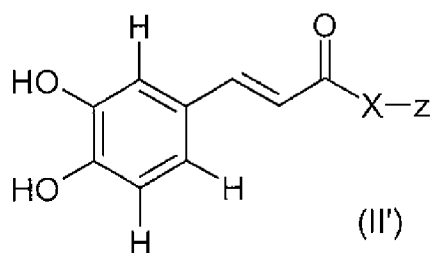
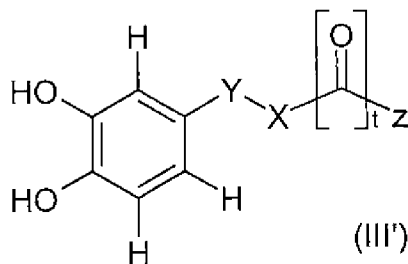
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substituted with one or more -OH; and $n = 2$ to 3500, or even 2 to 150; and $m = 1$ to 6;

- a radical $-L-(O-(CH_2)_x)_p-O-CH_3$

5 in which L represents a saturated linear C1-C30, in particular C6-C30, or even C8-C28, or unsaturated C2-C30, in particular C6-C30, or even C8-C28, hydrocarbon-based chain; optionally interrupted with one or more groups chosen from: -O-, -C(O)-, -NH-,
10 -C(O)O-, -C(O)NH- and -NHC(O)-; and/or optionally substituted with one or more -OH; and $x = 2$ or 3 and $p = 5$ to 200.

Preferentially, the compounds of formula (I')
15 correspond to the following formula (II') or (III'), and also salts and/or solvates thereof:



20 in which:

- X denotes $-NR_8-$ or $-O-$, with $R_8 = H$ or C1-C4 alkyl;
- Z denotes:

(iii) a silicone polymer radical of general formula $-L'-(Si(T)_2-O)_n-Si(T)_2-C_mH_{2m+1}$, in which T, which may be
25 identical or different, is a C1-C20 alkyl group, preferably methyl or ethyl; or a C1-C20 alkylamino group, in particular aminoethyl; or an iminopropyl group $-(CH_2)_3-NH-(CH_2)_2-NH_2$; or an aryl group, in particular phenyl; and in particular a radical
30 $-L'-(Si(CH_3)_2-O)_n-Si(CH_3)_2-C_mH_{2m+1}$ in which L' represents a saturated, linear C1-C30 or branched C3-C30, or unsaturated (having one or more unsaturations) C2-C30 hydrocarbon-based chain; said chain being optionally interrupted with one or more groups chosen from: -O-,

- 16 -

-C(O)- and -NH-, and combinations thereof, in particular -C(O)O-, -OC(O)-, -C(O)NH- and -NHC(O)-; said chain being optionally substituted with one or more OH; n = 2 to 3500, in particular 2 to 150; and
5 m = 1 to 6; or

(iv) a radical $-L'-(O-(CH_2)_x)_p-O-CH_3$ in which L' represents a saturated, linear C1-C30 or branched C3-C30, or unsaturated (having one or more
10 unsaturations) C2-C30 hydrocarbon-based chain; said chain being optionally interrupted with one or more groups chosen from: -O-, -C(O)- and -NH-, and combinations thereof, in particular -C(O)O-, -OC(O)-, -C(O)NH- and -NHC(O)-; said chain being optionally
15 substituted with one or more OH; x = 2 or 3 and p = 5 to 200;
- t = 0 or 1;
- Y denotes a saturated linear C1-C10 or branched C2-C10 hydrocarbon-based chain.

20

Preferably, in formula (II'):

- X = O or NH; and/or
- Z denotes:

(iii) a radical $-L'-(Si(CH_3)_2-O)_n-Si(CH_3)_2-C_mH_{2m+1}$ in
25 which L' represents a saturated, linear C1-C12 or branched C3-C12, or unsaturated (having one or more unsaturations) C2-C12 hydrocarbon-based chain; said chain being optionally interrupted with one or more groups chosen from: -O-, -NH-, -C(O)O-, -OC(O)-, -C(O)NH- and -NHC(O)-; said chain being optionally
30 substituted with one or more OH; n = 2 to 3500, in particular 2 to 150; and m = 1 to 6, in particular 2 to 5; or

(iv) a radical $-L'-(O-(CH_2)_x)_p-O-CH_3$ in which L' represents a saturated, linear C1-C12 or branched C3-C12, or unsaturated (having one or more
35 unsaturations) C2-C12 hydrocarbon-based chain, preferentially a saturated linear C1-C6 hydrocarbon-based chain; x = 2 and p = 5 to 200.

Preferably, in formula (III'):

- X = O or NH; and/or

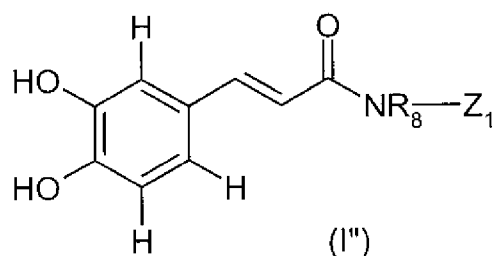
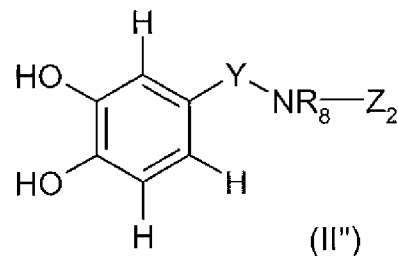
- Y denotes a saturated linear C1-C4 hydrocarbon-based
5 chain, preferentially -CH₂-CH₂-; and/or

- Z denotes:

(iii) a radical -L'-(Si(CH₃)₂-O)_n-Si(CH₃)₂-C_mH_{2m+1} in
which L' represents a saturated, linear C1-C12 or
branched C3-C12, or unsaturated (having one or more
10 unsaturations) C2-C12 hydrocarbon-based chain; said
chain being optionally interrupted with one or more
groups chosen from: -O-, -NH-, -C(O)O-, -OC(O)-,
-C(O)NH- and -NHC(O)-; said chain being optionally
substituted with one or more OH; n = 2 to 3500, in
15 particular 2 to 150; and m = 1 to 6, in particular 2 to
5; or

(iv) a radical -L'-(O-(CH₂)_x)_p-O-CH₃ in which L'
represents a saturated, linear C1-C12 or branched
C3-C12, or unsaturated (having one or more
20 unsaturations) C2-C12 hydrocarbon-based chain,
preferentially a saturated linear C1-C6 hydrocarbon-
based chain; x = 2 and p = 5 to 200.

Other novel compounds correspond to either of the
25 following formulae (I'') and (II''), the salts and
solvates thereof being included:



30 in which:

- R₈ = H or C1-C4 alkyl; preferably H;

- Y denotes a saturated linear C1-C10 or branched
C2-C10 hydrocarbon-based chain; and

- Z₁ denotes:

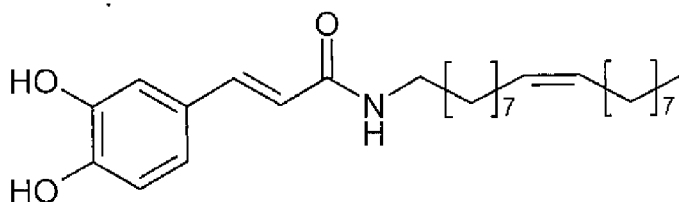
(i) a linear C15-C30 or branched C15-C30 alkyl radical, in which optionally one or more nonadjacent carbon atoms are replaced with a divalent radical chosen from -NR₇, -S-, -O- and -C(O)- and combinations thereof, in particular such as -O-C(O)-, -C(O)-O-, -C(O)-NR₇-, -NR₇-C(O)- or -NR₇-C(O)-NR₇-; said alkyl radical being optionally substituted with one or more OH and/or with an aryl, itself optionally substituted with one or more radicals, which may be identical or different, chosen from C1-C6 alkyls and OH radicals; R₇ denoting a hydrogen atom or a C1-C6 alkyl radical, optionally substituted with one or more C1-C4 alkyls and/or OH; or

(ii) a linear C15-C30 or branched C15-C30 (poly)alkenyl radical, in which optionally one or more nonadjacent carbon atoms are replaced with a divalent radical chosen from -NR₇, -S-, -O- and -C(O)- and combinations thereof, in particular such as -O-C(O)-, -C(O)-O-, -C(O)-NR₇-, -NR₇-C(O)- or -NR₇-C(O)-NR₇-; said alkenyl radical being optionally substituted with one or more OH and/or with an aryl, itself optionally substituted with one or more radicals, which may be identical or different, chosen from C1-C6 alkyls and OH radicals; R₇ denoting a hydrogen atom or a C1-C6 alkyl radical, optionally substituted with one or more C1-C4 alkyls and/or OH;

- Z₂ denotes:

(i) a linear C9-C30 or branched C9-C30 alkyl radical, in which optionally one or more nonadjacent carbon atoms are replaced with a divalent radical chosen from -NR₇, -S-, -O- and -C(O)- and combinations thereof, in particular such as -O-C(O)-, -C(O)-O-, -C(O)-NR₇-, -NR₇-C(O)- or -NR₇-C(O)-NR₇-; said alkyl radical being optionally substituted with one or more OH and/or with an aryl, itself optionally substituted with one or more radicals, which may be identical or different, chosen from C1-C6 alkyls and OH radicals; R₇ denoting a

hydrogen atom or a C1-C6 alkyl radical, optionally substituted with one or more C1-C4 alkyls and/or OH; or (ii) a linear C9-C30 or branched C9-C30 (poly)alkenyl radical, in which optionally one or more nonadjacent carbon atoms are replaced with a divalent radical chosen from -NR₇, -S- and -O- and combinations thereof, or else from -O-C(O)-, -C(O)-O-, -C(O)-NR₇-, -NR₇-C(O)- and -NR₇-C(O)-NR₇-; said radical being optionally substituted with one or more OH and/or with an aryl, itself optionally substituted with one or more radicals, which may be identical or different, chosen from C1-C6 alkyls and OH radicals; R₇ denoting a hydrogen atom or a C1-C6 alkyl radical, optionally substituted with one or more C1-C4 alkyls and/or OH; the following compound being excluded:



Preferably, in formula (I''), Z₁ denotes:

(i) a linear C15-C22, in particular C16-C20, or branched C15-C22, in particular C16-C20, alkyl radical, in which optionally one or more nonadjacent carbon atoms are replaced with a divalent radical chosen from -NH- and -O- and combinations thereof; said radical being optionally substituted with one or more OH and/or phenyl; or

(ii) a linear C15-C22, in particular C16-C20, or branched C15-C22, in particular C16-C20, (poly)alkenyl radical, in which optionally one or more nonadjacent carbon atoms are replaced with a divalent radical chosen from -NH- and -O- and combinations thereof; said radical being optionally substituted with one or more OH and/or phenyl.

Preferably, in formula (II''),

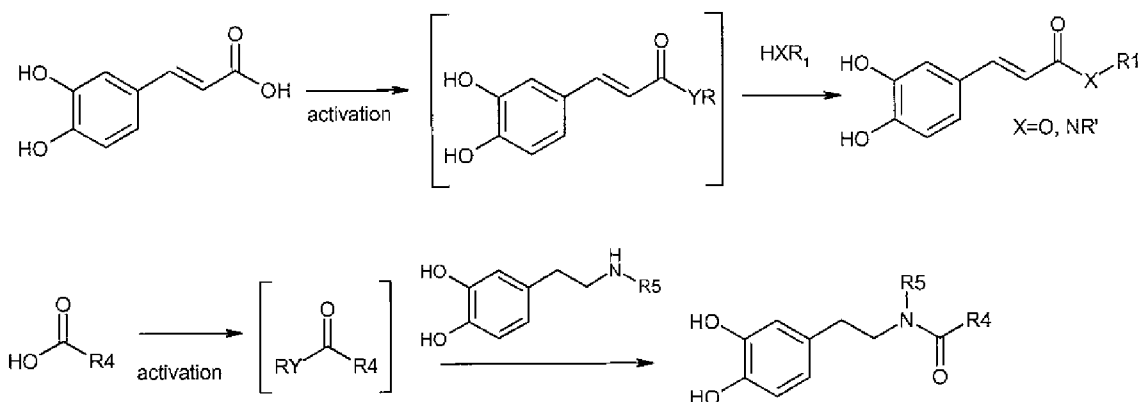
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- Y denotes a saturated linear C1-C4 hydrocarbon-based chain, preferentially -CH₂-CH₂-; and/or

- Z₂ denotes:

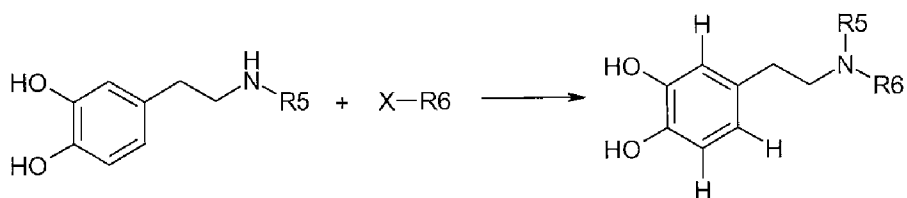
- (i) a linear C9-C22, in particular C10-C20, or branched C9-C22, in particular C10-C20, alkyl radical, in which optionally one or more nonadjacent carbon atoms are replaced with a divalent radical chosen from -NH- and -O- and combinations thereof; said radical being optionally substituted with one or more OH and/or phenyl; or
- (ii) a linear C9-C22, in particular C10-C20, or branched C9-C22, in particular C10-C20, (poly)alkenyl radical, in which optionally one or more nonadjacent carbon atoms are replaced with a divalent radical chosen from -NH- and -O- and combinations thereof; said radical being optionally substituted with one or more OH and/or phenyl.

The compounds of formula (I) can be obtained according to the synthesis routes described below.



The functionalization of the COOH function to give a COYR function can be carried out according to the conventional methods for activating acids, in particular described in "Comprehensive Organic Transformation by R. Larock, Wiley 5th Ed.", in the chapter "Interconversion of nitriles, carboxylic acids and derivatives"; the reaction of the activated form

with RYH is then carried out. Preferably, the activation methods are the formation of methyl ester or of acid chloride, for example by using thionyl chloride or oxalyl chloride, or 1-chloro-N,N-2-trimethyl-1-propenamine; or the formation of mixed anhydride, for example using alkyl chloroformates; or else the use of carbodiimides, such as, for example, DCC, DIC or EDC; or else of diethylcyanophosphate as described in "Phosphorus in organic synthesis-XI, Amino acids and peptides-XXI, Reaction of diethyl phosphorocyanidate with carboxylic acids. A new synthesis of carboxylic esters and amides, Tetrahedron, 32, 1976, 2211-2217".



15

An alkylating agent such as, for example, a haloalkane, an alkyl mesylate or an alkyl tosylate is reacted with the amine. An ion exchange can be carried out if necessary at the end of the reaction, by contact with an ion exchange resin chosen according to the exchanges desired. These resins are, for example, IRA 402 (alkyl sulphates-to-chlorides exchange), and IRA 400 (iodide-to-chloride exchange). The alkylation can also be carried out by reductive alkylation as described in Advanced Organic Chemistry, J March, 4th Ed., p. 898-900; or else by addition on a double bond, for example of Mickaël type as described in Advanced Organic Chemistry, J March, 4th Ed., p. 768-770.

The compounds of formula (I) find quite particular application in the cosmetics, in particular hair, field. They may be present in the composition in solubilized form, for example in water or an organic solvent, in particular ethanol, benzyl alcohol, butyl acetate, ethyl acetate, isopropyl myristate, PEGs

(polyethylene glycols) that are liquid at 25°C, isododecane, plant oils, liquid petroleum jelly, or else in a silicone solvent, such as volatile silicone oils, in particular D5; and also mixtures thereof. They
5 may also be present in the form of an aqueous or organic dispersion or a dispersion in silicone material, in particular in one of these solvents.

They can be used in the cosmetic compositions, in
10 particular hair compositions, in a proportion of from 0.001 to 20% by weight of dry matter, in particular from 0.1 to 15% by weight, or even from 1 to 10% by weight, and even better still from 2 to 5% by weight, relative to the total weight of the composition.

15 The cosmetic compositions according to the invention comprise a cosmetically acceptable medium, i.e. a medium that is compatible with keratin materials such as facial or body skin, the lips, the hair, the
20 eyelashes, the eyebrows and the nails.

The composition can thus comprise a hydrophilic medium comprising water and/or one or more hydrophilic organic solvents, such as alcohols and in particular linear or
25 branched C1-C6 monoalcohols, such as ethanol, tert-butanol, n-butanol, isopropanol or n-propanol, and polyols such as glycerol, diglycerol, propylene glycol, sorbitol, pentyleneglycol, hexyleneglycol, and polyethylene glycols, or alternatively ethers of
30 glycols, in particular C₂ glycols, and C₂-C₄ aldehydes which are hydrophilic.

The composition can also comprise a fatty phase, in particular consisting of fatty substances that are
35 liquid at ambient temperature (25°C in general) and/or of fatty substances that are solid at ambient temperature, such as waxes, pasty fatty substances, gums and mixtures thereof. These fatty substances may be of animal, plant, mineral or synthetic origin. This

fatty phase may also contain lipophilic organic solvents.

As fatty substances that are liquid at ambient
5 temperature, often referred to as oils, that can be
used in the invention, mention may be made of:
hydrocarbon-based oils of animal origin, such as
perhydrosqualene; hydrocarbon-based plant oils, such as
liquid triglycerides of fatty acids containing 4 to 10
10 carbon atoms, for instance heptanoic or octanoic acid
triglycerides, or else sunflower oil, maize oil, soya
oil, grapeseed oil, sesame oil, apricot oil, macadamia
oil, castor oil, avocado oil, caprylic/capric acid
triglycerides, jojoba oil, shea butter; linear or
15 branched hydrocarbons of mineral or synthetic origin,
such as liquid paraffins and derivatives thereof,
petroleum jelly, polydecenes, hydrogenated
polyisobutene such as parleam; synthetic esters and
ethers, in particular of fatty acids, for instance
20 purcellin oil, isopropyl myristate, 2-ethylhexyl
palmitate, 2-octyldodecyl stearate, 2-octyldodecyl
erucate, isostearyl isostearate; hydroxylated esters,
for instance isostearyl lactate, octyl hydroxystearate,
octyldodecyl hydroxystearate, diisostearyl malate,
25 triisocetyl citrate, fatty alcohol heptanoates,
octanoates and decanoates; polyol esters, for instance
propylene glycol dioctanoate, neopentyl glycol
diheptanoate, diethylene glycol diisononanoate;
pentaerythritol esters; fatty alcohols having 12 to 26
30 carbon atoms, for instance octyldodecanol,
2-butyloctanol, 2-hexyldecanol, 2-undecyl pentadecanol,
oleyl alcohol; partially hydrocarbon-based and/or
silicone-based fluoro oils; silicone oils, for instance
volatile or non-volatile, linear or cyclic
35 polydimethylsiloxanes (PDMSs) which are liquid or pasty
at ambient temperature (25°C), such as cyclomethicones,
dimethicones, optionally comprising a phenyl group, for
instance phenyl trimethicones, phenyl
trimethylsiloxydiphenylsiloxanes, diphenylmethyl-

dimethyltrisiloxanes, diphenyl dimethicones, phenyl dimethicones, polymethylphenylsiloxanes; mixtures thereof.

5 The composition according to the invention can also comprise one or more physiologically acceptable organic solvents. Mention may in particular be made, in addition to the hydrophilic organic solvents mentioned above, of ketones that are liquid at ambient
10 temperature, such as methyl ethyl ketone, methyl isobutyl ketone, diisobutyl ketone, isophorone, cyclohexanone or acetone; propylene glycol ethers that are liquid at ambient temperature, such as propylene glycol monomethyl ether, propylene glycol monomethyl
15 ether acetate, dipropylene glycol mono-n-butyl ether; short-chain esters (containing 3 to 8 carbon atoms in total), such as ethyl acetate, methyl acetate, propyl acetate, n-butyl acetate or isopentyl acetate; ethers that are liquid at 25°C, such as diethyl ether,
20 dimethyl ether or dichlorodiethyl ether; alkanes that are liquid at 25°C, such as decane, heptane, dodecane, isododecane or cyclohexane; aldehydes that are liquid at 25°C, such as benzaldehyde and acetaldehyde, and mixtures thereof.

25 The composition according to the invention can also comprise at least one ingredient commonly used in the cosmetics industry, such as vitamins, fragrances, pearlescent agents, thickeners, gelling agents, trace
30 elements, emollients, sequestering agents, basifying or acidifying agents, preservatives, sunscreens, surfactants, emulsifiers, antioxidants, anti-hair loss agents, antidandruff agents, propellants, ceramides, polymers, in particular film-forming polymers; fillers,
35 nacles, colorants and in particular pigments and dyes; reducing agents, and also mixtures thereof. Of course, those skilled in the art will take care to select this or these optional additional compound(s), and/or the amount thereof, in such a way that the advantageous

properties of the composition according to the invention are not, or not substantially, impaired by the addition envisaged.

5 Those skilled in the art will choose the appropriate galenical form, and also the method for preparing same, on the basis of their general knowledge, taking into account, firstly, the nature of the constituents used, in particular their solubility in the support, and
10 secondly, the application envisaged for the composition. Thus, the composition according to the invention may be in the form of a suspension, a dispersion, in particular of oil in water by virtue of vesicles; an aqueous, aqueous-alcoholic or oily
15 solution optionally thickened or even gelled; an oil-in-water, water-in-oil or multiple emulsion; an aqueous or aqueous-alcoholic gel, a foam; an oily or emulsified gel; a dispersion of vesicles, in particular lipid vesicles; a two-phase or multiphase lotion; a spray.
20 This composition can have the appearance of a lotion, a cream, an ointment, a soft paste, a salve, a solid cast or moulded especially as a stick or in a dish, or else a compacted solid.

25 The cosmetic composition according to the invention may be in the form of a product for caring for and/or making up bodily or facial skin, the lips, the nails, the eyelashes and/or the hair, an antisen or self-tanning product, or a hair product.

30 It especially has a particularly advantageous application in the hair care field, in particular for protecting and/or repairing keratin fibres, in particular damaged keratin fibres (hair).

35 The hair compositions are preferably shampoos, gels, hair setting lotions, blow-drying lotions, hair styling and fixing compositions such as lacquers or sprays, hair care or hair repair compositions, such as rinse-

out or leave-in conditioners, rinse-out or leave-in hair care products, aqueous or aqueous-alcoholic lotions for skin and/or hair care; sprays, in particular leave-in sprays; permanent-wave, hair
5 straightening, dyeing or bleaching compositions, or else in the form of rinse-out compositions to be applied before or after dyeing, bleaching, permanent-waving or relaxing the hair, or alternatively between the two steps of a permanent-waving or smoothing
10 operation.

The compositions may also be in the form of shower gels or bubble baths.

15 In one preferred embodiment, the compositions in accordance with the invention can be used for washing, caring for, treating, protecting and/or repairing keratin materials such as the hair, the skin, the eyelashes, the eyebrows, the nails, the lips or the
20 scalp, and more particularly the hair, especially damaged hair.

A subject of the invention is also a cosmetic treatment process for keratin materials such as the skin, the
25 lips, the eyelashes, the eyebrows, the nails or the hair, especially a hair treatment process, and in particular a process for protecting and/or repairing the hair, in which a cosmetic composition comprising at least one compound of formula (I) is applied to said
30 keratin materials.

Most particularly, it is a process for protecting and/or repairing the hair, in particular damaged hair.

35 It is possible to envisage a post-treatment of the hair after the application of the composition according to the invention, for example the application of heat and/or of UV radiation and/or of an oxidizing agent such as aqueous hydrogen peroxide.

The invention is illustrated in greater detail in the following examples.

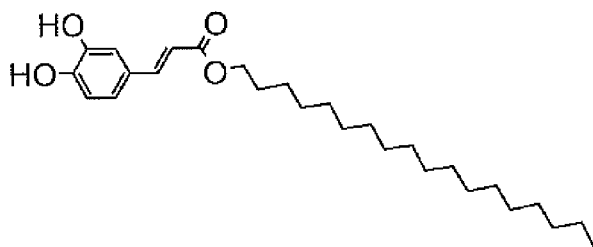
5 **Example 1**

The following cosmetic hair composition is prepared (% by weight):

- Compound 1: octadecyl
- 10 (2E)-3-(3,4-dihydroxyphenyl)prop-2-enoate: 5%
- The following solution: 0.75 ml
 - Benzyl alcohol: 52% (by volume)
 - PEG 400: 2.6% (by volume)
 - 96% ethanol: 33% (by volume)
 - 15 Manganese gluconate: 3 mg
 - Aqueous hydrogen peroxide (40V): 2.9 microlitres
 - Distilled water: qs 100% (by volume)

which gives a solution comprising 0.0375 g of compound
20 1 in 0.75 ml of solution.

Compound 1 (Synthesis described in Bioorganic and Medicinal Chemistry 2008, 16 (16), 7795-7803):



25

A lock of SA16 bleached hair (hydrophilic) is pretreated by immersion in the composition prepared above, in a proportion of 1.5 ml of composition for
30 0.15 g of hair, for ten minutes at 60°C. A treatment as defined hereinafter is subsequently carried out, and then the lock is rinsed with water and a cycle of 5 shampooing operations is carried out.

The evaluation of the hydrophobic nature of the locks is carried out using a Krüss K100 Tensiometer microbalance.

- 5 The effects of the compound are indicated as recovery rate relative, on the one hand, to the natural hair (hair therefore not bleached, having undergone neither pretreatment nor treatment) and, on the other hand, to the control hair (SA16 bleached hair, having not
10 undergone pretreatment, but treated identically).

Treatment

The treatment consists in passing a smoothing iron over
15 the hair 10 times, followed by 1 hour of UVA irradiation (14.09 mW/cm^2) and UVB irradiation (0.45 mW/cm^2) simultaneously.

Results

20 It is noted that the SA16 hair pretreated according to the invention is brought back to a level of hydrophobicity close to that of the natural hair. The wet lock is supple and easy to disentangle. Once dried
25 under a hood for 15 minutes, this lock is soft to the touch and smooth to the ends. It disentangles well. The level of hydrophobicity measured for the SA16 hair pretreated according to the invention corresponds to 61% of the natural hair, whereas it is 0% for the SA16
30 hair not pretreated.

The level of hydrophobicity measured for the control hair (SA16 bleached, not having undergone pretreatment, but treated identically) corresponds to -2.2% of the
35 natural hair.

Example 2

- 29 -

The following cosmetic hair composition is prepared (% by weight):

- Compound 1: octadecyl
(2E)-3-(3,4-dihydroxyphenyl)prop-2-enoate: 5%
- 5 - The following solution: 0.75 ml
 - Benzyl alcohol: 52% (by volume)
 - PEG 400: 2.6% (by volume)
 - 96% ethanol: 33% (by volume)
 - Manganese gluconate: 3 mg
 - 10 Aqueous hydrogen peroxide (40V): 2.9 microlitres
 - Distilled water: qs 100% (by volume)

which gives a solution comprising 0.0375 g of compound 1 in 0.75 ml of solution.

- 15 A lock of SA16 bleached hair (hydrophilic) is pretreated by immersion in the composition thus prepared, in a proportion of 1.5 ml of composition for 0.15 g of hair, for ten minutes at 60°C. A treatment as
- 20 defined hereinafter is subsequently carried out, and then the lock is rinsed with water and a cycle of 5 shampooing operations is carried out.

- The evaluation of the hydrophobic nature of the locks
- 25 is carried out using a krüss K100 Tensiometer microbalance.

- The effects of the compounds are indicated as recovery rate relative to the natural hair (hair therefore not
- 30 bleached, having undergone neither pretreatment nor treatment).

Treatment

- 35 The treatment consists in passing a smoothing iron over the hair 10 times.

Results

It is noted that the SA16 hair pretreated according to the invention is brought back to a level of hydrophobicity close to that of the natural hair. The wet lock is supple and easy to disentangle. Once dried under a hood for 15 minutes, this lock is soft to the touch and smooth to the ends. It disentangles well. The level of hydrophobicity measured for the SA16 hair pretreated according to the invention corresponds to 47% of the natural hair.

Example 3

The following cosmetic hair composition is prepared (% by weight):

- Compound 2: (2E)-3,7,11,15-tetramethylhexadec-2-en-1-yl (2E)-3-(3,4-dihydroxyphenyl)prop-2-enoate:

5%

- The following solution: 0.75 ml

Benzyl alcohol: 52% (by volume)

PEG 400: 2.6% (by volume)

96% ethanol: 33% (by volume)

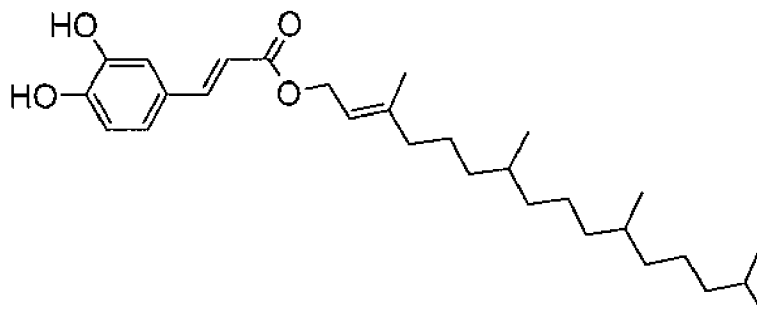
Manganese gluconate: 3 mg

Aqueous hydrogen peroxide (40V): 2.9 microlitres

Distilled water: qs 100% (by volume)

which gives a solution comprising 0.0375 g of compound 2 in 0.75 ml of solution.

Compound 2 (Synthesis described in FR 2634779):



A lock of SA16 bleached hair (hydrophilic) is pretreated by immersion in the composition thus prepared, in a proportion of 1.5 ml of composition for 0.15 g of hair, for ten minutes at 60°C. A treatment as
5 defined hereinafter is subsequently carried out, and then the lock is rinsed with water and a cycle of 5 shampooing operations is carried out.

The evaluation of the hydrophobic nature of the locks
10 is carried out using a krüss K100 Tensiometer microbalance.

The effects of the compounds are indicated as recovery rate relative, on the one hand, to the natural hair
15 (hair therefore not bleached, having undergone neither pretreatment nor treatment) and, on the other hand, to the control hair (SA16 bleached hair, having not undergone pretreatment, but treated identically).

20 Treatment

The treatment consists in passing a smoothing iron over the hair 10 times, followed by 1 hour of UVA irradiation (14.09 mW/cm²) and UVB irradiation
25 (0.45 mW/cm²) simultaneously.

Results

It is noted that the SA16 hair pretreated according to
30 the invention is brought back to a level of hydrophobicity close to that of the natural hair. The wet lock is supple and easy to disentangle. Once dried under a hood for 15 minutes, this lock is soft to the touch and smooth to the ends. It disentangles well. The
35 level of hydrophobicity measured for the SA16 hair pretreated according to the invention corresponds to 62% of the natural hair.

The level of hydrophobicity measured for the control hair (SA16 bleached, not having undergone pretreatment, but treated identically) corresponds to -2.2% of the natural hair.

5

Example 4

The following cosmetic hair composition is prepared (% by weight):

- 10 - Compound 2:
(2E)-3,7,11,15-tetramethylhexadec-2-en-1-yl (2E)-3-(3,4-dihydroxyphenyl)prop-2-enoate: 5%
- The following solution: 0.75 ml
Benzyl alcohol: 52% (by volume)
15 PEG 400: 2.6% (by volume)
96% ethanol: 33% (by volume)
Manganese gluconate: 3 mg
Aqueous hydrogen peroxide (40V): 2.9 microlitres
Distilled water: qs 100% (by volume)

20

which gives a solution comprising 0.0375 g of compound 2 in 0.75 ml of solution.

25 A lock of SA16 bleached hair (hydrophilic) is pretreated by immersion in the composition thus prepared, in a proportion of 1.5 ml of composition for 0.15 g of hair, for ten minutes at 60°C. A treatment as defined hereinafter is subsequently carried out, and then the lock is rinsed with water and a cycle of 5
30 shampooing operations is carried out.

The evaluation of the hydrophobic nature of the locks is carried out using a krüss K100 Tensiometer microbalance.

35

The effects of the compounds are indicated as recovery rate relative, on the one hand, to the natural hair (hair therefore not bleached, having undergone neither pretreatment nor treatment) and, on the other hand, to

the control hair (SA16 bleached hair not having undergone pretreatment, but treated identically).

Treatment

5

The treatment consists in immersing the lock in a solution of sodium bicarbonate at pH 8-9, followed by 1 hour of UVA irradiation (14.09 mW/cm²) and UVB irradiation (0.45 mW/cm²) simultaneously.

10

Results

It is noted that the SA16 hair pretreated according to the invention is brought back to a level of hydrophobicity close to that of the natural hair. The wet lock is supple and easy to disentangle. Once dried under a hood for 15 minutes, this lock is soft to the touch and smooth to the ends. It disentangles well. The level of hydrophobicity measured for the SA16 hair pretreated according to the invention corresponds to 52% of the natural hair.

The level of hydrophobicity measured for the control hair (SA16 bleached, not having undergone pretreatment, but treated identically) corresponds to -1.5% of the natural hair.

Example 5

The following cosmetic hair composition is prepared (% by weight):

- Compound 2:

(2E)-3,7,11,15-tetramethylhexadec-2-en-1-yl (2E)-3-(3,4-dihydroxyphenyl)prop-2-enoate: 5%

35 - The following solution: 0.75 ml

Benzyl alcohol: 52% (by volume)

PEG 400: 2.6% (by volume)

96% ethanol: 33% (by volume)

Manganese gluconate: 3 mg

- 34 -

Aqueous hydrogen peroxide (40V): 2.9 microlitres
Distilled water: qs 100% (by volume)

which gives a solution comprising 0.0375 g of compound
5 2 in 0.75 ml of solution.

A lock of SA16 bleached hair (hydrophilic) is
pretreated by immersion in the composition thus
prepared, in a proportion of 1.5 ml of composition for
10 0.15 g of hair, for ten minutes at 60°C. A treatment as
defined hereinafter is subsequently carried out, and
then the lock is rinsed with water and a cycle of 5
shampooing operations is carried out.

15 The evaluation of the hydrophobic nature of the locks
is carried out using a krüss K100 Tensiometer
microbalance.

The effects of the compounds are indicated as recovery
20 rate relative, on the one hand, to the natural hair
(hair therefore not bleached, having undergone neither
pretreatment nor treatment) and, on the other hand, to
the control hair (SA16 bleached hair not having
undergone pretreatment, but treated identically).

25

Treatment

The treatment consists of 1 hour of UVA irradiation
(14.09 mW/cm²) and UVB irradiation (0.45 mW/cm²)
30 simultaneously.

Results

It is noted that the SA16 hair pretreated according to
35 the invention is brought back to a level of
hydrophobicity close to that of the natural hair. The
wet lock is supple and easy to disentangle. Once dried
under a hood for 15 minutes, this lock is soft to the
touch and smooth to the ends. It disentangles well. The

- 35 -

level of hydrophobicity measured for the SA16 hair pretreated according to the invention corresponds to 42% of the natural hair.

- 5 The level of hydrophobicity measured for the control hair (SA16 bleached, not having undergone pretreatment, but treated identically) corresponds to -7.3% of the natural hair.

10 **Example 6**

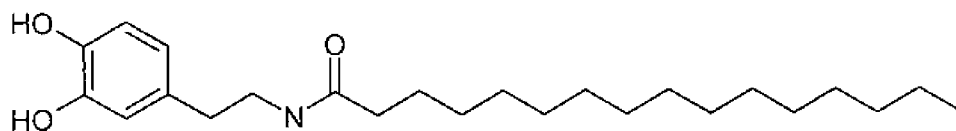
The following cosmetic hair composition is prepared (% by weight):

- | | |
|--------------------------------------|-----------------|
| - Compound 3: | 5% |
| 15 - The following solution: | 0.75 ml |
| Benzyl alcohol: 52% (by volume) | |
| PEG 400: 2.6% (by volume) | |
| 96% ethanol: 33% (by volume) | |
| Manganese gluconate: 3 mg | |
| 20 Aqueous hydrogen peroxide (40V): | 2.9 microlitres |
| Distilled water: qs 100% (by volume) | |

which gives a solution comprising 0.0375 g of compound 3 in 0.75 ml of solution.

25

Compound 3: N-[2-(3,4-dihydroxyphenyl)ethyl]hexadecanamide



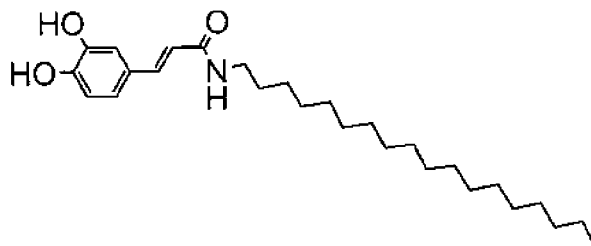
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Synthesis described in the publication Annales Pharmaceutiques Françaises 1991, 49 (2), 99-110.

Example 7

35

Compound 4: (2E)-3-(3,4-dihydroxyphenyl)-N-octadecyl-prop-2-enamide



5

10.3 g of N,N'-dicyclohexylcarbodiimide (50 mmol) are added to a solution of 9 g of (2E)-3-(3,4-dihydroxyphenyl)prop-2-enoic acid (cafeic acid) (50 mmol) and of 13.5 g of octadecan-1-amine (octadecylamine) (50 mmol) in 600 ml of THF. The solution is stirred at 60°C for 3 hours. The final product is obtained by filtration and evaporation of the solvent, and then drying under reduced pressure.

15 21 g (49 mmol) of desired compound are obtained in the form of a white powder with a yield of 97%.

¹H NMR (DMSO): δ 0.8 ppm (t, 3H); δ 1.20 ppm (m, 32H); δ 3.16 ppm (t, 2H); δ 6.2 ppm (s, 1H); δ 6.44 ppm (s, 1H); δ 6.76 ppm (s, 1H); δ 6.94 ppm (s, 1H); δ 7.16 ppm (s, 1H); δ 7.34 ppm (s, 1H); δ 7.84 ppm (m, 2H); δ 8.8 ppm (m, 1H)

Elemental analysis: measured: % C: 75.25, % H: 10.52, % N: 3.44, % O: 11.22
expected: % C: 75.13, % H: 10.51, % N: 3.24, % O: 11.12

Example 8

The following cosmetic hair composition is prepared (% by weight):

- Compound 4: (prepared in Example 7) 5%
- The following solution: 0.75 ml
 - Benzyl alcohol: 52% (by volume)

- 37 -

PEG 400: 2.6% (by volume)
96% ethanol: 33% (by volume)
Manganese gluconate: 3 mg
Aqueous hydrogen peroxide (40V): 2.9 microlitres
5 Distilled water: qs 100% (by volume)

which gives a solution comprising 0.0375 g of compound 4 in 0.75 ml of solution.

10 A lock of SA16 bleached hair (hydrophilic) is pretreated by immersion in the composition thus prepared, in a proportion of 1.5 ml of composition for 0.15 g of hair, for ten minutes at 60°C. A treatment as defined hereinafter is subsequently carried out, and
15 then the lock is rinsed with water and a cycle of 5 shampooing operations is carried out.

The evaluation of the hydrophobic nature of the locks is carried out using a krüss K100 Tensiometer
20 microbalance.

The effects of the compounds are indicated as recovery rate relative, on the one hand, to the natural hair (hair therefore not bleached, having undergone neither pretreatment nor treatment) and, on the other hand, to
25 the control hair (SA16 bleached hair not having undergone pretreatment, but treated identically).

Treatment

30 The treatment consists in passing a smoothing iron over the hair 10 times, followed by 1 hour of UVA irradiation (14.09 mW/cm²) and UVB irradiation (0.45 mW/cm²) simultaneously.

35

Results

It is noted that the SA16 hair pretreated according to the invention is brought back to a level of

hydrophobicity close to that of the natural hair. The wet lock is supple and easy to disentangle. Once dried under a hood for 15 minutes, this lock is soft to the touch and smooth to the ends. It disentangles well. The level of hydrophobicity measured for the SA16 hair pretreated according to the invention corresponds to 110% of the natural hair.

The level of hydrophobicity measured for the control hair (SA16 bleached, not having undergone pretreatment, but treated identically) corresponds to -2.2% of the natural hair.

Example 9

The following cosmetic hair composition is prepared (% by weight):

- Compound 4: (prepared in Example 7) 5%
 - The following solution: 0.75 ml
- Benzyl alcohol: 52% (by volume)
PEG 400: 2.6% (by volume)
96% ethanol: 33% (by volume)
Manganese gluconate: 3 mg
Aqueous hydrogen peroxide (40V): 2.9 microlitres
Distilled water: qs 100% (by volume)

which gives a solution comprising 0.0375 g of compound 4 in 0.75 ml of solution.

A lock of SA16 bleached hair (hydrophilic) is pretreated a first time by immersion in the composition thus prepared, in a proportion of 1.5 ml of composition for 0.15 g of hair, for ten minutes at 60°C. A second pretreatment is subsequently carried out by immersion in a solution of sodium bicarbonate (pH 9) for ten minutes at ambient temperature. Finally, the treatment as defined hereinafter is carried out, and then the lock is rinsed with water and a cycle of 5 shampooing operations is carried out.

The evaluation of the hydrophobic nature of the locks is carried out using a krüss K100 Tensiometer microbalance.

5

The effects of the compounds are indicated as recovery rate relative, on the one hand, to the natural hair (hair therefore not bleached, having undergone neither pretreatment nor treatment) and, on the other hand, to the control hair (SA16 bleached hair not having undergone pretreatment, but treated identically).

Treatment

The treatment consists of 1 hour of UVA irradiation (14.09 mW/cm^2) and UVB irradiation (0.45 mW/cm^2) simultaneously.

Results

20

It is noted that the SA16 hair pretreated according to the invention is brought back to a level of hydrophobicity close to that of the natural hair. The wet lock is supple and easy to disentangle. Once dried under a hood for 15 minutes, this lock is soft to the touch and smooth to the ends. It disentangles well. The level of hydrophobicity measured for the SA16 hair pretreated according to the invention corresponds to 59% of the natural hair.

30

The level of hydrophobicity measured for the control hair (SA16 bleached, not having undergone pretreatment, but treated identically) corresponds to -2.6% of the natural hair.

35

Example 10

The following cosmetic hair composition is prepared (% by weight):

- 40 -

- Compound 4: (prepared in Example 7) 5%
- The following solution: 0.75 ml
 - Benzyl alcohol: 52% (by volume)
 - PEG 400: 2.6% (by volume)
 - 5 96% ethanol: 33% (by volume)
 - Manganese gluconate: 3 mg
 - Aqueous hydrogen peroxide (40V): 2.9 microlitres
 - Distilled water: qs 100% (by volume)

10 which gives a solution comprising 0.0375 g of compound 4 in 0.75 ml of solution.

A lock of SA16 bleached hair (hydrophilic) is pretreated a first time by immersion in the composition
15 thus prepared, in a proportion of 1.5 ml of composition for 0.15 g of hair, for ten minutes at 60°C. A second pretreatment is subsequently carried out by immersion in a solution of sodium bicarbonate (pH 9) for ten minutes at ambient temperature. Finally, the treatment
20 as defined hereinafter is carried out, and then the lock is rinsed with water and a cycle of 5 shampooing operations is carried out.

The evaluation of the hydrophobic nature of the locks
25 is carried out using a krüss K100 Tensiometer microbalance.

The effects of the compounds are indicated as recovery rate relative to the natural hair (hair therefore not
30 bleached, having undergone neither pretreatment nor treatment).

Treatment

35 The treatment consists in passing a smoothing iron over the hair 10 times.

Results

It is noted that the SA16 hair pretreated according to the invention is brought back to a level of hydrophobicity close to that of the natural hair. The wet lock is supple and easy to disentangle. Once dried
5 under a hood for 15 minutes, this lock is soft to the touch and smooth to the ends. It disentangles well. The level of hydrophobicity measured for the SA16 hair pretreated according to the invention corresponds to a value of greater than 42% of the natural hair.

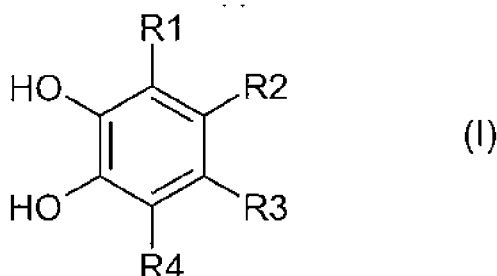
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The level of hydrophobicity measured for the control hair (SA16 bleached, not having undergone pretreatment, but treated identically) corresponds to -2.2% of the natural hair.

15

CLAIMS

1. Cosmetic treatment process for keratin materials,
in which a cosmetic composition comprising at
5 least one compound of formula (I), or salts or
solvates thereof:



10 in which R1 to R4, which may be identical or
different, denote:

- a hydrogen atom,
- a halogen,
- a carboxyl radical (COOH);
- 15 - a C1-C6 alkyl carboxylate radical (COOR);
- an NRR' radical with R and R', independently of
one another, representing H or C1-C6 alkyl;
- a linear C1-C40 or branched C3-C40 alkyl radical
- 20 (saturated), in which optionally one or more
nonadjacent carbon atoms are replaced with a
divalent radical chosen from: -NR₇-, -S-, -O- and
-C(O)- and combinations thereof, in particular
such as -O-C(O)-, -C(O)-O-, -C(O)-NR₇-, -NR₇-C(O)-
25 or -NR₇-C(O)-NR₇-; and/or said alkyl radical being
optionally substituted with one or more OH and/or
with an aryl, itself optionally substituted with
one or more radicals, which may be identical or
different, chosen from C1-C6 alkyls and the
- 30 radicals OH and NRR';
- a linear C2-C40 or branched C3-C40 (poly)alkenyl
radical (one or more unsaturations), in which
optionally one or more nonadjacent carbon atoms

are replaced with a divalent radical chosen from:
-NR₇, -S-, -O- and -C(O)- and combinations
thereof, in particular such as -O-C(O)-, -C(O)-O-,
-C(O)-NR₇-, -NR₇-C(O)- or -NR₇-C(O)-NR₇-; and/or
5 said alkenyl radical being optionally substituted
with one or more OH;

- an aryl group, optionally substituted with one
or more C1-C30 alkyl radicals, in which optionally
10 one or more nonadjacent carbon atoms are replaced
with a divalent radical chosen from: -NR₇, -S-,
-O- and -C(O)- and combinations thereof, in
particular such as -O-C(O)-, -C(O)-O-, -C(O)-NR₇-,
-NR₇-C(O)- or -NR₇-C(O)-NR₇-;

15 - a silicone polymer radical of general formula
-L-(Si(T)₂-O)_n-Si(T)₂-C_mH_{2m+1} in which T, which may
be identical or different, is a C1-C20 alkyl
group, preferably methyl or ethyl; or a C1-C20
20 alkylamino group, in particular aminoethyl; or an
iminopropyl group -(CH₂)₃-NH-(CH₂)₂-NH₂; or an aryl
group, in particular phenyl; n, L and m are
defined below; preferably a radical -L-(Si(CH₃)₂-
O)_n-Si(CH₃)₂-C_mH_{2m+1} in which L, representing a
25 linker between the catechol unit and the silicone
chain, represents a saturated, linear C1-C40 or
branched C3-C40, or unsaturated (having one or
more C=C unsaturations) C2-C40 hydrocarbon-based
chain; said chain being optionally interrupted
30 with one or more groups chosen from: -O-, -C(O)-,
-NH- and NR₇, and combinations thereof, in
particular -C(O)O-, -OC(O)-, -C(O)NH-, -NHC(O)-, -
NHC(O)NH- and -OC(O)O-; and/or said chain being
optionally substituted with one or more groups
35 chosen from -OR₅, -C(O)OR₅, -C(O)NHR₅ and -NR₆R₅,
with R₅ and R₆, which may be identical or
different, representing a hydrogen atom or a
linear or branched C1-C6 alkyl radical; and n = 2
to 3500; and m = 1 to 6;

- a radical $-L-(O-(CH_2)_x)_p-O-CH_3$
in which L represents a saturated, linear C1-C40
or branched C3-C40, or unsaturated (having one or
5 more C=C unsaturations) C2-C40 hydrocarbon-based
chain; said chain being optionally interrupted
with one or more groups chosen from: -O-, -C(O)-,
-NH- and NR_7 , and combinations thereof, in
particular -C(O)O-, -OC(O)-, -C(O)NH-, -NHC(O)-,
10 -NHC(O)NH- and -OC(O)O-; and/or said chain being
optionally substituted with one or more groups
chosen from: -OR₅-, -C(O)OR₅, -C(O)NHR₅ and -NR₆R₅,
with R₅ and R₆, which may be identical or
different, representing a hydrogen atom or a
15 linear or branched C1-C6 alkyl radical;
and x = 2 or 3 and p = 5 to 200;

in all of these radicals, R₇ denoting a hydrogen
atom or a C1-C6 alkyl radical, optionally
20 substituted with one or more C1-C4 alkyls and/or
OH;

it being understood that at least one of the
radicals R₁, R₂, R₃ and/or R₄ is other than
25 hydrogen,

is applied to said keratin materials.

2. Process according to Claim 1, in which, in formula
30 (I), R₁ = R₂ = R₃ = H or else R₁ = R₃ = R₄ = H.

3. Process according to either of the preceding
claims, in which the radical(s) R₁ to R₄ other
than hydrogen is (are) chosen from:

35 - a linear C2-C32, in particular C6-C30, or even
C8-C28, or branched C3-C32, in particular C6-C30,
or even C8-C28, alkyl radical (saturated), in
which optionally one or more nonadjacent carbon
atoms are replaced with a divalent radical chosen

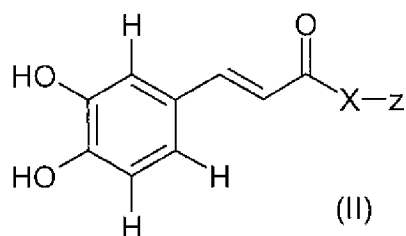
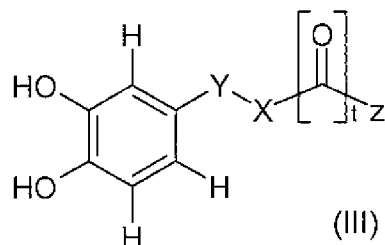
from $-NR_7$, $-O-$, $-OC(O)-$, $-C(O)O-$, $-C(O)NR_7-$ and $-NR_7-C(O)-$;

5 - a linear C2-C32, in particular C6-C30, or even C8-C28, or branched C3-C32, in particular C6-C30, or even C8-C28, (poly)alkenyl radical (one or more C=C unsaturations, in particular one or two unsaturations), in which optionally one or more nonadjacent carbon atoms are replaced with a divalent radical chosen from: $-NR_7$, $-O-$, $-OC(O)-$, $-C(O)O-$, $-C(O)NR_7-$ and $-NR_7-C(O)-$;

10 - a radical $-L-(Si(CH_3)_2O)_n-Si(CH_3)_2-C_mH_{2m+1}$ in which L represents a saturated linear C1-C30, in particular C6-C30, or even C8-C28, or unsaturated C2-C30, in particular C6-C30, or even C8-C28, hydrocarbon-based chain; optionally interrupted with one or more groups chosen from: $-O-$, $-C(O)-$, $-NH-$, $-C(O)O-$, $-C(O)NH-$ and $-NCH(O)-$; and/or optionally substituted with one or more $-OH$; and $n = 2$ to 3500 and $m = 1$ to 6;

20 - a radical $-L-(O-(CH_2)_x)_p-O-CH_3$ in which L represents a saturated linear C1-C30, in particular C6-C30, or even C8-C28, or unsaturated C2-C30, in particular C6-C30, or even C8-C28, hydrocarbon-based chain; optionally interrupted with one or more groups chosen from: $-O-$, $-C(O)-$, $-NH-$, $-C(O)O-$, $-C(O)NH-$ and $-NHC(O)-$; and/or optionally substituted with one or more $-OH$; and $x = 2$ or 3 and $p = 5$ to 200.

30 4. Process according to one of the preceding claims, in which the compound of formula (I) corresponds to one of the following formulae (II) and (III), and also salts and/or solvates thereof:



in which:

- X denotes $\text{-NR}_8\text{-}$ or -O- , with $\text{R}_8 = \text{H}$ or C1-C4 alkyl;

- Z denotes:

(i) a linear C1-C30 or branched C3-C30 alkyl radical, in which optionally one or more nonadjacent carbon atoms are replaced with a divalent radical chosen from: $\text{-NR}_7\text{-}$, -S- , -O- and -C(O)- and combinations thereof, in particular such as -O-C(O)- , -C(O)-O- , $\text{-C(O)-NR}_7\text{-}$, $\text{-NR}_7\text{-C(O)-}$ or $\text{-NR}_7\text{-C(O)-NR}_7\text{-}$; said radical being optionally substituted with one or more OH; R_7 denoting a hydrogen atom or a C1-C6 alkyl radical, optionally substituted with one or more C1-C4 alkyls and/or OH; or

(ii) a linear C2-C30 or branched C3-C30 (poly)alkenyl radical, in which optionally one or more nonadjacent carbon atoms are replaced with a divalent radical chosen from: $\text{-NR}_7\text{-}$, -S- , -O- and -C(O)- and combinations thereof, in particular such as -O-C(O)- , -C(O)-O- , $\text{-C(O)-NR}_7\text{-}$, $\text{-NR}_7\text{-C(O)-}$ or $\text{-NR}_7\text{-C(O)-NR}_7\text{-}$; said radical being optionally substituted with one or more OH; or

(iii) a radical $\text{-L'-(Si(CH}_3)_2\text{-O)}_n\text{-Si(CH}_3)_2\text{-C}_m\text{H}_{2m+1}\text{-}$, in which L' represents a saturated, linear C1-C30 or branched C3-C30, or unsaturated (having one or more unsaturations) C2-C30 hydrocarbon-based chain; said chain being optionally interrupted with one or more groups chosen from: -O- , -C(O)- and -NH- , and combinations thereof, in particular -C(O)O- , -OC(O)- , -C(O)NH- and -NHC(O)- ; said

chain being optionally substituted with one or more OH; $n = 2$ to 3500 and $m = 1$ to 6;

(iv) a radical $-L'-(O-(CH_2)_x)_p-O-CH_3$, in which L' represents a saturated, linear C1-C30 or branched C3-C30, or unsaturated (having one or more unsaturations) C2-C30 hydrocarbon-based chain; said chain being optionally interrupted with one or more groups chosen from: $-O-$, $-C(O)-$ and $-NH-$, and combinations thereof, in particular $-C(O)O-$, $-OC(O)-$, $-C(O)NH-$ and $-NHC(O)-$; said chain being optionally substituted with one or more OH; $x = 2$ or 3 and $p = 5$ to 200;

- $t = 0$ or 1;

- Y denotes a saturated linear C1-C10 or branched C2-C10 hydrocarbon-based chain.

5. Process according to Claim 4, in which, in formula (II):

- $X = O$ or NH ; and/or

- Z denotes:

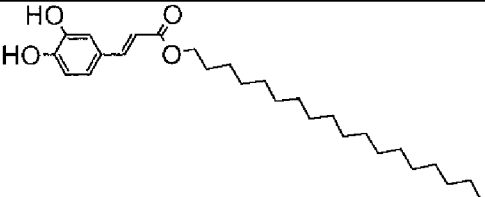
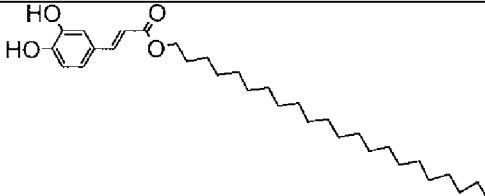
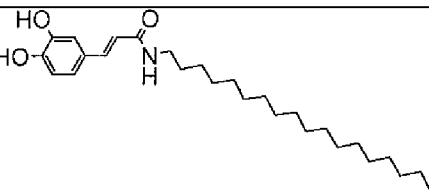
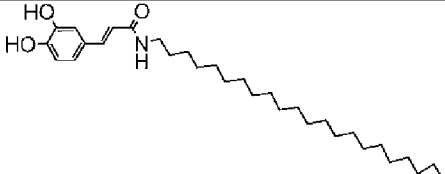
(i) a linear C1-C22, in particular C4-C20, or branched C3-C22, in particular C4-C20, alkyl radical, in which optionally one or more nonadjacent carbon atoms are replaced with a divalent radical chosen from $-NH-$ and $-O-$ and combinations thereof; said radical being optionally substituted with one or more OH; or

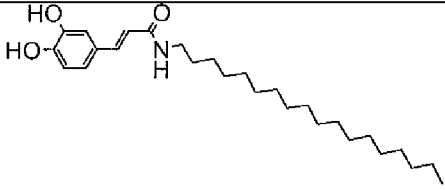
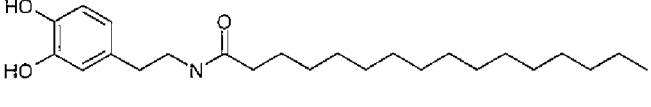
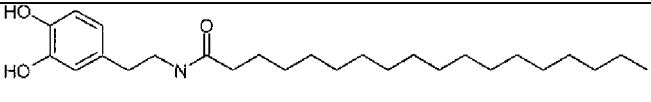
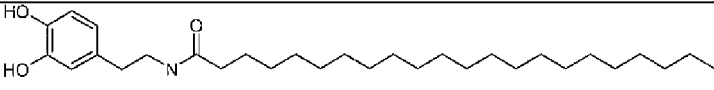
(ii) a linear C2-C22, in particular C4-C20, or branched C3-C22, in particular C4-C20, (poly)alkenyl radical, in which optionally one or more nonadjacent carbon atoms are replaced with a divalent radical chosen from $-NH-$ and $-O-$ and combinations thereof; said radical being optionally substituted with one or more OH; or

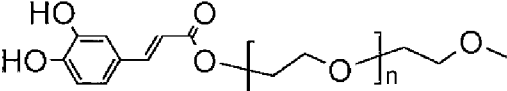
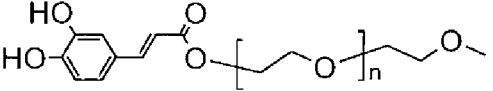
(iii) a radical $-L'-(Si(CH_3)_2-O)_n-Si(CH_3)_2-C_mH_{2m+1}$, in which L' represents a saturated, linear C1-C12 or branched C3-C12, or unsaturated (having one or

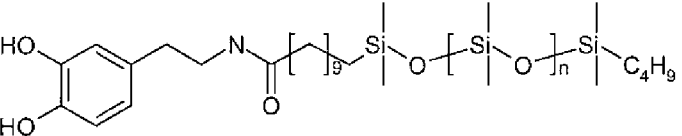
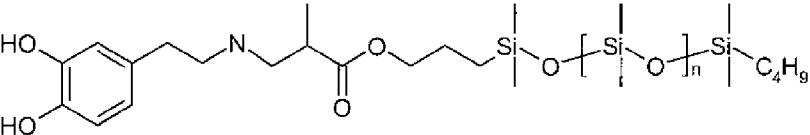
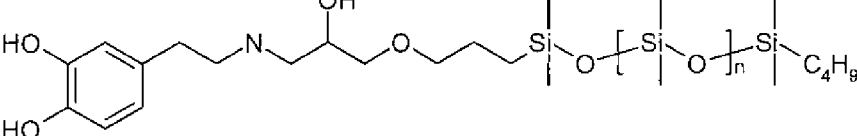
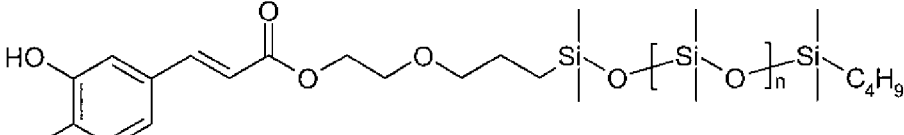
- more unsaturations) C2-C12 hydrocarbon-based chain; said chain being optionally interrupted with one or more groups chosen from: -O-, -NH-, -C(O)O-, -OC(O)-, -C(O)NH- and -NHC(O)-; said chain being optionally substituted with one or more OH; n = 2 to 3500, in particular 2 to 150, and m = 1 to 6, in particular 2 to 5; or
- (iv) a radical -L'-(O-(CH₂)_x)_p-O-CH₃, in which L' represents a saturated, linear C1-C12 or branched C3-C12, or unsaturated (having one or more unsaturations) C2-C12 hydrocarbon-based chain, preferably saturated linear C1-C6 hydrocarbon-based chain; x = 2 and p = 5 to 200.
6. Process according to Claim 4, in which, in formula (III):
- X = O or NH; and/or
 - Y denotes a saturated linear C1-C4 hydrocarbon-based chain, preferentially -CH₂-CH₂-; and/or
 - Z denotes:
 - (i) a linear C1-C22, in particular C4-C20, or branched C3-C22, in particular C4-C20, alkyl radical, in which optionally one or more nonadjacent carbon atoms are replaced with a divalent radical chosen from -NH- and -O- and combinations thereof; said radical being optionally substituted with one or more OH; or
 - (ii) a linear C2-C22, in particular C4-C20, or branched C3-C22, in particular C4-C20, (poly)alkenyl radical, in which optionally one or more nonadjacent carbon atoms are replaced with a divalent radical chosen from -NH- and -O- and combinations thereof; said radical being optionally substituted with one or more OH; or
 - (iii) a radical -L'-(Si(CH₃)₂-O)_n-Si(CH₃)₂-C_mH_{2m+1}, in which L' represents a saturated, linear C1-C12 or branched C3-C12, or unsaturated (having one or more unsaturations) C2-C12 hydrocarbon-based chain; said chain being optionally interrupted

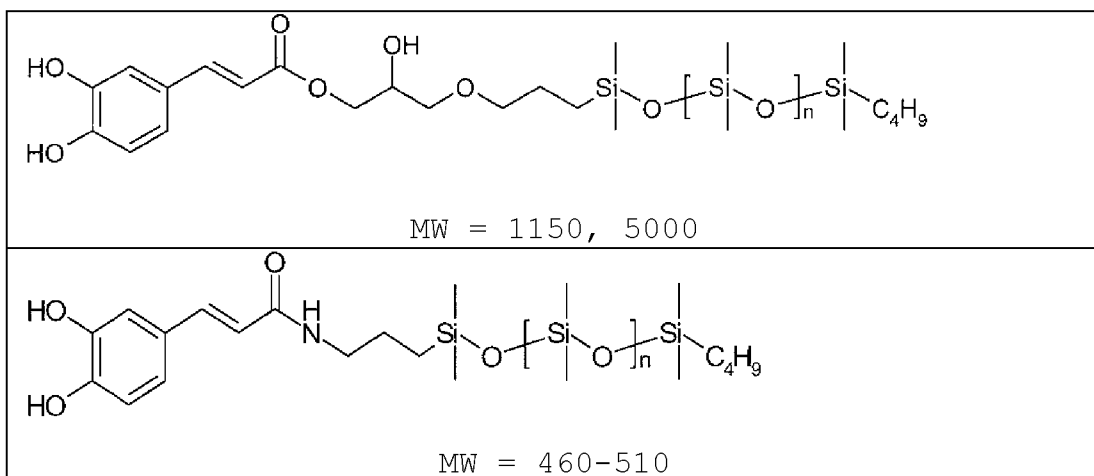
- with one or more groups chosen from: -O-, -NH-,
-C(O)O-, -OC(O)-, -C(O)NH- and -NHC(O)-; said
chain being optionally substituted with one or
more OH; n = 2 to 3500, in particular 2 to 150,
5 and m = 1 to 6, in particular 2 to 5; or
(iv) a radical -L'-(O-(CH₂)_x)_p-O-CH₃, in which L'
represents a saturated, linear C1-C12 or branched
C3-C12, or unsaturated (having one or more
unsaturations) C2-C12 hydrocarbon-based chain,
10 preferably saturated linear C1-C6 hydrocarbon-
based chain; x = 2 and p = 5 to 200.
7. Process according to one of the preceding claims,
in which the compounds are chosen from the
15 following compounds, and also salts and/or
solvates thereof:

Compound	Name
	octadecyl (2E)-3-(3,4-dihydroxyphenyl)prop-2-enoate
	(2E)-3,7,11,15-tetramethylhexadec-2-en-1-yl (2E)-3-(3,4-dihydroxyphenyl)prop-2-enoate
	docosyl (2E)-3-(3,4-dihydroxyphenyl)prop-2-enoate
	(2E)-3-(3,4-dihydroxyphenyl)-N-octadecylprop-2-enamide

	(2E)-3-(3,4-dihydroxyphenyl)-N-docosylprop-2-enamide
	N-[2-(3,4-dihydroxyphenyl)ethyl]-hexadecanamide
	N-[2-(3,4-dihydroxyphenyl)ethyl]-octadecanamide
	N-[2-(3,4-dihydroxyphenyl)ethyl]docosanamide

 n=10 (PEG 500)	 PEG5000
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 MW = 1600	
 MW = 750, 1150, 5000, 10 000	
 MW = 1150, 5000	
 MW = 1150, 5000, 10 000	



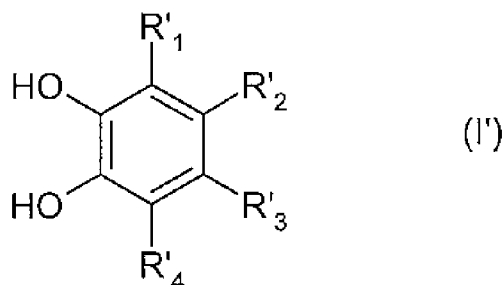
8. Process according to one of the preceding claims, in which the compounds of formula (I) are present in the composition in solubilized form, for example in water or an organic solvent, in particular ethanol, benzyl alcohol, butyl acetate, ethyl acetate, isopropyl myristate, PEGs (polyethylene glycols) that are liquid at 25°C, isododecane, plant oils, liquid petroleum jelly, or else in a silicone solvent, such as volatile silicone oils, in particular D5; and also mixtures thereof; or in the form of an aqueous or organic dispersion or a dispersion in a silicone substance, in particular in one of these solvents.
9. Process according to one of the preceding claims, in which the compounds of formula (I) are present in the composition in a proportion of from 0.001 to 20% by weight of dry matter, in particular from 0.1 to 15% by weight, or even from 1 to 10% by weight, and even better still from 2 to 5% by weight, relative to the total weight of the composition.
10. Process according to one of the preceding claims, in which the composition comprises a cosmetically acceptable medium, which comprises at least one ingredient chosen from water, hydrophilic organic solvents, waxes, pasty fatty substances, gums,

oils, lipophilic organic solvents, vitamins, fragrances, pearlescent agents, thickeners, gelling agents, trace elements, emollients, sequestering agents, basifying or acidifying agents, preservatives, sunscreens, surfactants, emulsifiers, antioxidants, anti-hair loss agents, antidandruff agents, propellants, ceramides, polymers, in particular film-forming polymers; fillers, nacles, colorants, and in particular pigments and dyes; reducing agents, and also mixtures thereof.

11. Process according to one of the preceding claims, in which the composition is in the form of a product for caring for and/or making up bodily or facial skin, the lips, the nails, the eyelashes and/or the hair, an antisen or self-tanning product, or a hair product, in particular for protecting and/or repairing keratin fibres, in particular damaged keratin fibres (hair).

12. Process according to one of the preceding claims, consisting of a hair treatment process, most particularly for damaged hair; in particular a process for protecting and/or repairing the hair, most particularly damaged hair.

13. Compound having the following formula (I'), and salts and solvates thereof:



in which R'1 to R'4, which may be identical or different, denote:

- a hydrogen atom, or

5 - a silicone polymer radical of general formula
 $-L-(Si(T)_2-O)_nSi(T)_2-C_mH_{2m+1}$ in which T, which may be
 identical or different, is a C1-C20 alkyl group,
 preferably methyl or ethyl; or a C1-C20 alkylamino
 group, in particular aminoethyl; or an iminopropyl
 10 group $-(CH_2)_3-NH-(CH_2)_2-NH_2$; or an aryl group, in
 particular phenyl; n, L and m are defined below;
 preferably a radical $-L-(Si(CH_3)_2-O)_nSi(CH_3)_2-C_mH_{2m+1}$
 in which L represents a saturated, linear C1-C40
 or branched C3-C40, or unsaturated C2-C40
 15 hydrocarbon-based chain; said chain being
 optionally interrupted with one or more groups
 chosen from: -O-, -C(O)-, -NH- and NR_7 , and
 combinations thereof, in particular -C(O)O-,
 -OC(O)-, -C(O)NH-, -NHC(O)-, -NHC(O)NH- and
 20 -OC(O)O-; and/or said chain being optionally
 substituted with one or more groups chosen from
 $-OR_5$, $-C(O)OR_5$, $-C(O)NHR_5$ and $-NR_6R_5$, with R_5 and
 R_6 , which may be identical or different,
 representing a hydrogen atom or a linear or
 25 branched C1-C6 alkyl radical; and $n = 2$ to 3500
 and $m = 1$ to 6; or

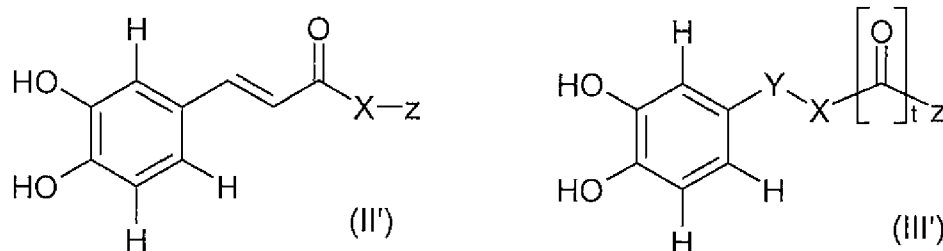
- a radical $-L-(O-(CH_2)_x)_p-O-CH_3$
 in which L represents a saturated, linear C1-C40
 30 or branched C3-C40, or unsaturated C2-C40
 hydrocarbon-based chain; said chain being
 optionally interrupted with one or more groups
 chosen from -O-, -C(O)-, -NH- and NR_7 , and
 combinations thereof, in particular -C(O)O-,
 35 -OC(O)-, -C(O)NH-, -NHC(O)-, -NHC(O)NH- and
 -OC(O)O-; and/or said chain being optionally
 substituted with one or more groups chosen from
 $-OR_5$, $-C(O)OR_5$, $-C(O)NHR_5$ and $-NR_6R_5$, with R_5 and
 R_6 , which may be identical or different,

representing a hydrogen atom or a linear or branched C1-C6 alkyl radical; and $x = 2$ or 3 and $p = 5$ to 200 ;

5 with R7 denoting a hydrogen atom or a C1-C6 alkyl radical, optionally substituted with one or more C1-C4 alkyls and/or OH;
it being understood that at least one of the radicals R'1, R'2, R'3 and/or R'4 is other than
10 hydrogen.

14. Compound according to Claim 13, corresponding to the following formula (II') or (III'), and also salts and/or solvates thereof:

15



in which:

- X denotes -NR₈- or -O-, with R₈ = H or C1-C4 alkyl;

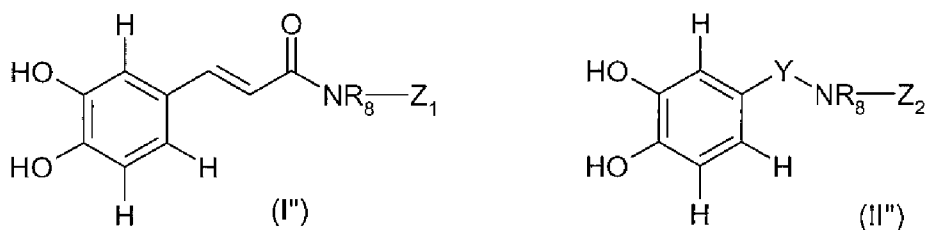
- Z denotes:

(iii) a radical -L'-(Si(CH₃)₂-O)_n-Si(CH₃)₂-C_mH_{2m+1},
in which L' represents a saturated, linear C1-C30 or branched C3-C30, or unsaturated (having one or more unsaturations) C2-C30 hydrocarbon-based chain; said chain being optionally interrupted with one or more groups chosen from: -O-, -C(O)- and -NH-, and combinations thereof, in particular -C(O)O-, -OC(O)-, -C(O)NH- and -NHC(O)-; said chain being optionally substituted with one or more OH; $n = 2$ to 3500 , and $m = 1$ to 6 ; or

(iv) a radical -L'-(O-(CH₂)_x)_p-O-CH₃ in which L' represents a saturated, linear C1-C30 or branched C3-C30, or unsaturated (having one or more

unsaturations) C2-C30 hydrocarbon-based chain;
 said chain being optionally interrupted with one
 or more groups chosen from: -O-, -C(O)- and -NH-,
 and combinations thereof, in particular -C(O)O-,
 5 -OC(O)-, -C(O)NH- and -NHC(O)-; said chain being
 optionally substituted with one or more OH; $x = 2$
 or 3 and $p = 5$ to 200;
 - $t = 0$ or 1;
 - Y denotes a saturated linear C1-C10 or branched
 10 C2-C10 hydrocarbon-based chain.

15. Compound corresponding to one of the following
 formulae (I'') and (II''), the salts and solvates
 thereof being included:
 15



in which:

- R₈ = H or C1-C4 alkyl; preferably H;
 20 - Y denotes a saturated linear C1-C10 or branched
 C2-C10 hydrocarbon-based chain; and
 - Z₁ denotes:
 (i) a linear C15-C30 or branched C15-C30 alkyl
 radical, in which optionally one or more
 25 nonadjacent carbon atoms are replaced with a
 divalent radical chosen from -NR₇, -S-, -O- and
 -C(O)- and combinations thereof, in particular
 such as -O-C(O)-, -C(O)-O-, -C(O)-NR₇-, -NR₇-C(O)-
 or -NR₇-C(O)-NR₇-; said alkyl radical being
 30 optionally substituted with one or more OH and/or
 with an aryl, itself optionally substituted with
 one or more radicals, which may be identical or
 different, chosen from C1-C6 alkyls and OH
 radicals; R₇ denoting a hydrogen atom or a C1-C6

alkyl radical, optionally substituted with one or more C1-C4 alkyls and/or OH; or

(ii) a linear C15-C30 or branched C15-C30 (poly)alkenyl radical, in which optionally one or more nonadjacent carbon atoms are replaced with a divalent radical chosen from -NR₇, -S-, -O- and -C(O)- and combinations thereof, in particular such as -O-C(O)-, -C(O)-O-, -C(O)-NR₇-, -NR₇-C(O)- or -NR₇-C(O)-NR₇-; said alkenyl radical being optionally substituted with one or more OH and/or with an aryl, itself optionally substituted with one or more radicals, which may be identical or different, chosen from C1-C6 alkyls and OH radicals; R₇ denoting a hydrogen atom or a C1-C6 alkyl radical, optionally substituted with one or more C1-C4 alkyls and/or OH;

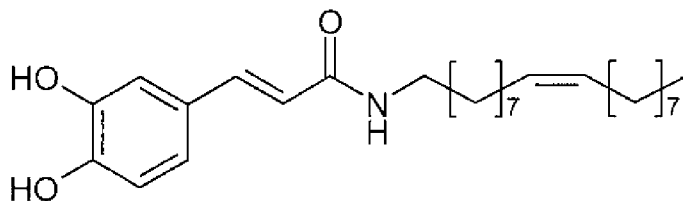
- Z₂ denotes:

(i) a linear C9-C30 or branched C9-C30 alkyl radical, in which optionally one or more nonadjacent carbon atoms are replaced with a divalent radical chosen from -NR₇, -S-, -O- and -C(O)- and combinations thereof, in particular such as -O-C(O)-, -C(O)-O-, -C(O)-NR₇-, -NR₇-C(O)- or -NR₇-C(O)-NR₇-; said alkyl radical being optionally substituted with one or more OH and/or with an aryl, itself optionally substituted with one or more radicals, which may be identical or different, chosen from C1-C6 alkyls and OH radicals; R₇ denoting a hydrogen atom or a C1-C6 alkyl radical, optionally substituted with one or more C1-C4 alkyls and/or OH; or

(ii) a linear C9-C30 or branched C9-C30 (poly)alkenyl radical, in which optionally one or more nonadjacent carbon atoms are replaced with a divalent radical chosen from -NR₇, -S- and -O- and combinations thereof, or else from -O-C(O)-, -C(O)-O-, -C(O)-NR₇-, -NR₇-C(O)- and -NR₇-C(O)-NR₇-; said radical being optionally substituted with one or more OH and/or with an

aryl, itself optionally substituted with one or more radicals, which may be identical or different, chosen from C1-C6 alkyls and OH radicals; R7 denoting a hydrogen atom or a C1-C6 alkyl radical, optionally substituted with one or more C1-C4 alkyls and/or OH;

the following compound being excluded:



10

16. Compound according to Claim 15, in which, in formula (I''), Z₁ denotes:

(i) a linear C15-C22, in particular C16-C20, or branched C15-C22, in particular C16-C20, alkyl radical, in which optionally one or more nonadjacent carbon atoms are replaced with a divalent radical chosen from -NH- and -O- and combinations thereof; said radical being optionally substituted with one or more OH and/or phenyl; or

(ii) a linear C15-C22, in particular C16-C20, or branched C15-C22, in particular C16-C20, (poly)alkenyl radical, in which optionally one or more nonadjacent carbon atoms are replaced with a divalent radical chosen from -NH- and -O- and combinations thereof; said radical being optionally substituted with one or more OH and/or phenyl.

17. Compound according to Claim 15, in which, in formula (II''),

- Y denotes a saturated linear C1-C4 hydrocarbon-based chain, preferentially -CH₂-CH₂-; and/or

- Z₂ denotes:

- (i) a linear C9-C22, in particular C10-C20, or branched C9-C22, in particular C10-C20, alkyl radical, in which optionally one or more nonadjacent carbon atoms are replaced with a divalent radical chosen from -NH- and -O- and combinations thereof; said radical being optionally substituted with one or more OH and/or phenyl; or
- (ii) a linear C9-C22, in particular C10-C20, or branched C9-C22, in particular C10-C20, (poly)alkenyl radical, in which optionally one or more nonadjacent carbon atoms are replaced with a divalent radical chosen from -NH- and -O- and combinations thereof; said radical being optionally substituted with one or more OH and/or phenyl.
18. Cosmetic composition comprising, in a cosmetically acceptable medium, at least one compound of formula (I') as defined in either of Claims 13 and 14, and/or at least one compound of formula (I'') or (II'') as defined in one of Claims 15 to 17.
19. Composition according to Claim 18, in which the compounds of formula(e) (I'), (I'') and/or (II'') are present in solubilized form, for example in water or an organic solvent, in particular ethanol, benzyl alcohol, butyl acetate, ethyl acetate, isopropyl myristate, PEGs (polyethylene glycols) that are liquid at 25°C, isododecane, plant oils, liquid petroleum jelly, or else in a silicone solvent, such as volatile silicone oils, in particular D5; and also mixtures thereof; or in the form of an aqueous or organic dispersion or a dispersion in a silicone substance, in particular in one of these solvents.
20. Composition according to either of Claims 18 and 19, in which the compounds of formula(e) (I'),

(I'') and/or (II'') are present in the composition in a proportion of from 0.001 to 20% by weight of dry matter, in particular from 0.1 to 15% by weight, or even from 1 to 10% by weight, and better still from 2 to 5% by weight, relative to the total weight of the composition.

21. Composition according to one of Claims 18 to 20, in which the cosmetically acceptable medium comprises at least one ingredient chosen from water, hydrophilic organic solvents, waxes, pasty fatty substances, gums, oils, lipophilic organic solvents, vitamins, fragrances, pearlescent agents, thickeners, gelling agents, trace elements, emollients, sequestering agents, basifying or acidifying agents, preservatives, sunscreens, surfactants, emulsifiers, antioxidants, anti-hair loss agents, antidandruff agents, propellants, ceramides, polymers, in particular film-forming polymers; fillers, nacles, colorants, and in particular pigments and dyes; reducing agents, and also mixtures thereof.

22. Composition according to one of Claims 18 to 21, which is in the form of a product for caring for and/or making up bodily or facial skin, the lips, the nails, the eyelashes and/or the hair, an antisen or self-tanning product, or a hair product, in particular for protecting and/or repairing keratin fibres, in particular damaged keratin fibres (hair).

INTERNATIONAL SEARCH REPORT

International application No
PCT/EP2011/066081

A. CLASSIFICATION OF SUBJECT MATTER
INV. A61K8/34 A61Q5/00 C07C69/612 C07C235/34
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)
C07D A61K A61Q C07C

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 practical, search terms used)

EPO-Internal, WPI Data, BEILSTEIN Data

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	FR 2 814 943 A1 (OREAL [FR]) 12 April 2002 (2002-04-12) claim 11	1-22
X	----- EP 2 196 180 A2 (OREAL [FR]) 16 June 2010 (2010-06-16) claims 1, 4	1-22
X	----- EP 0 403 238 A2 (UNILEVER PLC [GB]; UNILEVER NV [NL]) 19 December 1990 (1990-12-19) page 7; claim 1; example 4	1-22
X	----- EP 1 029 849 A1 (HAARMANN & REIMER GMBH [DE]) 23 August 2000 (2000-08-23) page 3, paragraphs 8, 14 - page 4 ----- -/-	1-22



Further documents are listed in the continuation of Box C.



See patent family annex.

* Special categories of cited documents :

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"O" document referring to an oral disclosure, use, exhibition or other means

"P" document published prior to the international filing date but later than the priority date claimed

"T" later document published after the international filing date or priority date and not in conflict with the application but cited to understand the principle or theory underlying the invention

"X" document of particular relevance; the claimed invention cannot be considered novel or cannot be considered to involve an inventive step when the document is taken alone

"Y" document of particular relevance; the claimed invention cannot be considered to involve an inventive step when the document is combined with one or more other such documents, such combination being obvious to a person skilled in the art.

"&" document member of the same patent family

Date of the actual completion of the international search

9 December 2011

Date of mailing of the international search report

15/12/2011

Name and mailing address of the ISA/

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Authorized officer

Lewis, Sara

INTERNATIONAL SEARCH REPORT

International application No

PCT/EP2011/066081

C(Continuation). DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	WO 2005/115326 A1 (SHOWA DENKO KK [JP]; SHIBUYA AKIRA [JP]; KATO EIKO [JP]; KAMACHI MOTO) 8 December 2005 (2005-12-08) claim 23 -----	1-3, 9-12, 14-22
X	WO 2008/128704 A1 (DSM IP ASSETS BV [NL]; RAEDERSTORFF DANIEL [FR]; WANG-SCHMIDT YING [CH]) 30 October 2008 (2008-10-30) claim 3 -----	1-3,9-12
X	US 2006/110415 A1 (GUPTA SHYAM K [US]) 25 May 2006 (2006-05-25) claim 16 -----	1-3,9-12
X	WO 2006/078399 A2 (LIPO CHEMICALS INC [US]; DAYAN NAVA [US]; RIEMER JED A [US]) 27 July 2006 (2006-07-27) claim 4 -----	1-22
X	ISHIDA H ET AL: "STUDIES OF THE ACTIVE SUBSTANCES IN HERBS USED FOR HAIR TREATMENT. II. ISOLATION OF HAIR REGROWTH SUBSTANCES, ACETOSYRINGONE AND POLYPORUSTERONE A AND B, FROM POLYPORUS UMBELLATUS FRIES", BIOLOGICAL & PHARMACEUTICAL BULLETIN (OF JAPAN), PHARMACEUTICAL SOCIETY OF JAPAN, TOKYO, JP, vol. 22, no. 11, 1 November 1999 (1999-11-01), pages 1189-1192, XP001109068, ISSN: 0918-6158 page 1191; table 3 -----	1-3,9-12
X	US 2005/129633 A1 (LIN CONNIE B [US] LIN CONNIE BAOZHEN [US]) 16 June 2005 (2005-06-16) claim 2 -----	1-3,9-12
X	WO 2005/044289 A2 (COGNIS FRANCE SA [FR]; HENRY FLORENCE [FR]; DANOUX LOUIS [FR]; PAULY G) 19 May 2005 (2005-05-19) claim 2 -----	1-3,9-12
X	US 2003/069307 A1 (LEY JAKOB PETER [DE]) 10 April 2003 (2003-04-10) claim 1 -----	1-3,9-12
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INTERNATIONAL SEARCH REPORT

International application No

PCT/EP2011/066081

C(Continuation). DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	BERNINI ET AL: "Chemoselective and efficient carbomethoxylation of the alcoholic chain of phenols by dimethyl carbonate (DMC)", TETRAHEDRON LETTERS, ELSEVIER, AMSTERDAM, NL, vol. 48, no. 39, 29 August 2007 (2007-08-29), pages 7000-7003, XP022218640, ISSN: 0040-4039, DOI: 10.1016/J.TETLET.2007.07.109 Scheme 1, compound 8 -----	1-3,9-12
X	US 5 686 082 A (N GUYEN QUANG-LAN [FR]) 11 November 1997 (1997-11-11) claim 1 -----	1-12
X	DE 201 10 355 U1 (WELLA AG [DE]) 30 August 2001 (2001-08-30) claim 1 -----	1-12
X,P	WO 2011/020857 A2 (OREAL [FR]; LALLEMAN BORIS [FR]) 24 February 2011 (2011-02-24) claim 2 -----	1,2

INTERNATIONAL SEARCH REPORT

Information on patent family members

International application No

PCT/EP2011/066081

Patent document cited in search report	Publication date	Patent family member(s)	Publication date
FR 2814943	A1	12-04-2002	NONE
EP 2196180	A2	16-06-2010	CN 101791269 A 04-08-2010 EP 2196180 A2 16-06-2010 FR 2939645 A1 18-06-2010 JP 2010195770 A 09-09-2010 US 2010150857 A1 17-06-2010
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