

ORGANIC COMPOUNDS AND THEIR USE FOR GENERATING A FRAGRANT ALCOHOL

TECHNICAL FIELD

The present invention relates generally to fragrance precursors, which are able to release
5 fragrant alcohols. The invention also relates to perfume preparations and consumer products
containing said precursors. The invention further relates to methods of making said perfume
precursors, perfume preparations and consumer products, as well as the use of said perfume
precursors and perfume preparations in consumer products, such as personal care and
household care products.

10

BACKGROUND

Perfumed consumer products such as personal care, cleaning or laundry products comprising
fragrances are well-known in the art. However, it is known that fragrances can be altered
through degradation caused by interaction with air or when incorporated in certain consumer
product bases, where alkalinity, acidity, the presence of oxidizing agents, such as hypochlorite
15 salts, or other base components may lead to chemical degradation of the fragrance. In addition,
volatile fragrances tend to be dissipated with time. Furthermore, when used in the perfumed
consumer products mentioned above, the deposition of the fragrance on a treated substrate is
diminished by the washing and/or rinsing procedure.

Nevertheless, it is desired by consumers to have products that can be stored over time and still
20 giving a constant perfume impression. In particular, the impact of volatile components is to be
retained. Furthermore, it is desired that such products create a long-lasting pleasing fragrance
slowly emitting from the treated substrate over time.

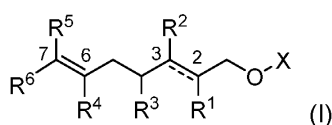
To address these needs, fragrance precursors can be used, which are substances that are
essentially odorless themselves, but which, in particular circumstances, will decompose to
25 release the fragrant molecule.

There are several classes of known precursors which release fragrant molecules upon
activation, such as hydrolysis, temperature change, oxygen, action of light and enzymes. For
example, WO2012085287 reports a group of precursors able to release a fragrance by
spontaneous air oxidation. In WO2007143873 another group of precursors is described which
30 can be cleaved by hydrolysis.

All precursors do show different stability, and they release the fragrant molecule under different conditions. There is still need to provide precursors able to release fragrant alcohols over an extended time period and which can be easily incorporated into a variety of consumer products.

SUMMARY

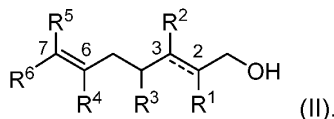
- 5 In accordance with a first aspect of the present invention there is provided a compound of formula (I)



wherein

----- is indicating a carbon-carbon single or double bond between C2 and C3;

- 10 R^1 , R^3 , R^4 , R^5 and R^6 is independently selected from the group consisting of H, Me and Et;
 R^2 is selected from the group consisting of H, Me and Et, or forms together with the carbon atoms C2 and C3 a 3 membered ring; and
 X is selected from the group consisting of
 aryl bearing up to two substituents selected from the group consisting of hydroxy, methoxy,
 15 ethoxy, formyl, allyl, oxoalkyl, oxoalkenyl and alkyl alkenoate;
 benzyl bearing a substituent selected from the group consisting of hydroxymethyl, formyl, vinyl, (C=O)Me, (C=O)Et, (C=O)OMe, (C=O)OEt, (C=O)Ph at the benzylic position;
 propan-2-yl substituted with phenyl, naphthalen-1-yl or naphthalen-2-yl at position 2;
 dimethyl 2-malonate and diethyl 2-malonate; and
 20 alkanoyl (C(O)- R^{10}), with R^{10} selected from linear or branched C_4 to C_{18} alkyl, linear or branched C_4 to C_{18} alkenyl with one or two double bonds, linear or branched C_4 to C_{18} ether and oxoalkyl, and hydroxyphenyl,
 with the proviso that the compound is not nona-2,6-dien-1-yl palmitate,
 as precursor for generating a fragrant alcohol of formula (II)



In accordance with a second aspect of the present invention there is provided a use of a compound of formula (I) as fragrance precursor which is capable of releasing fragrant alcohols of formula (II) over an extended time period.

5 In accordance with a third aspect of the present invention there are provided fragrance compositions and consumer products comprising said compounds of formula (I).

In accordance with a fourth aspect of the present invention there is provided a method to release a fragrant alcohol of formula (II).

In accordance with a fifth aspect of the present invention there are provided methods of making said perfume precursors, perfume preparations and consumer products.

10 In accordance with a sixth aspect of the present invention there is provided the use of said perfume precursors of formula (I) and perfume preparations in consumer products, such as fabric care, personal care and household care products.

15 In accordance with a seventh aspect of the present invention there is provided a method to confer, enhance, improve or modify the hedonic properties of a fragrance composition or a consumer product.

Certain embodiments of any aspect of the present invention may provide one or more of the following advantages:

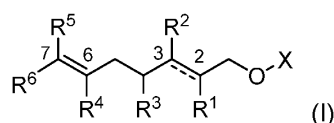
- release of fragrant alcohols,
- efficient delivery of the odors of fragrant alcohols in consumer products, and
- 20 • stability of fragrance precursors in consumer product bases as well as after their deposition on substrates.

The details, examples and preferences provided in relation to any particular one or more of the stated aspects of the present invention will be further described herein and apply equally to all aspects of the present invention. Any combination of the embodiments, examples and
25 preferences described herein in all possible variations thereof is encompassed by the present invention unless otherwise indicated herein, or otherwise clearly contradicted by context.

DETAILED DESCRIPTION

The present invention is based on the surprising finding that ethers and esters of fragrant alcohols can serve as fragrance precursors able to release said fragrant alcohols. These fragrance precursors provide a high substantivity of the fragrant alcohols and are robust in different consumer products.

- 5 There is therefore provided a compound of formula (I)



wherein

----- is indicating a carbon-carbon single or double bond between C2 and C3;

R¹, R³, R⁴, R⁵ and R⁶ is independently selected from the group consisting of H, Me and Et;

- 10 R² is selected from the group consisting of H, Me and Et, or forms together with the carbon atoms C2 and C3 a 3 membered ring; and

X is selected from the group consisting of

aryl bearing up to two substituents selected from the group consisting of hydroxy, methoxy, ethoxy, formyl, allyl, oxoalkyl, oxoalkenyl and alkyl alkenoate;

- 15 benzyl bearing a substituent selected from the group consisting of formyl, vinyl, (C=O)Me, (C=O)Et, (C=O)OMe, (C=O)OEt, (C=O)Ph at the benzylic position;

propan-2-yl substituted with phenyl, naphthalen-1-yl or naphthalen-2-yl at position 2;

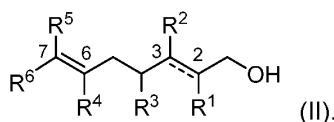
dimethyl 2-malonate and diethyl 2-malonate; and

alkanoyl (C(O)-R¹⁰), with R¹⁰ selected from linear or branched C₄ to C₁₈ alkyl, linear or branched

- 20 C₄ to C₁₈ alkenyl with one or two double bonds, linear or branched C₄ to C₁₈ ether and oxoalkyl, and hydroxyphenyl,

with the proviso that the compound is not nona-2,6-dien-1-yl palmitate,

as precursor for generating a fragrant alcohol of formula (II)



- 25 The substituents R¹ – R⁶ and the bond with the dotted line in the compound of formula (II) are defined as in the compound of formula (I).

The term aryl means for example phenyl or naphthyl.

The term alkyl alkenoate means for example methyl or ethyl acrylate.

The term linear or branched C₄ to C₁₈ alkyl means all linear or branched alkyl chains having between 4 and 18 carbon atoms, for example C₅, C₆, C₇, C₈, C₉, C₁₀, C₁₁, C₁₂, C₁₃, C₁₄, C₁₅, C₁₆ or C₁₇ alkyl etc.

- 5 The term linear or branched C₄ to C₁₈ alkenyl with one or two double bonds means all linear or branched alkenyl chains having one or two double bonds, for example C₅, C₆, C₇, C₈, C₉, C₁₀, C₁₁, C₁₂, C₁₃, C₁₄, C₁₅, C₁₆ or C₁₇ alkenyl. In case of two double bonds, they can be isolated or conjugated.

- 10 The term linear or branched C₄ to C₁₈ ether and oxoalkyl, oxoalkenyl means all linear or branched alkyl or alkenyl chains having between 4 and 18 carbon atoms as mentioned above and bearing an ether group or an oxo group in the chain, for example 3-oxobutyl.

- 15 The term benzyl bearing a substituent selected from the group consisting of hydroxymethyl, formyl, (C=O)Me, (C=O)Et, (C=O)OMe, (C=O)OEt, (C=O)Ph at the benzylic position means for example 2-phenyl-ethanal, 2-phenyl-ethanol, (2-oxopropyl)-1-phenyl, methyl 2-phenyl ethanoate and 2-oxo-1,2-diphenyl-1-ethyl.

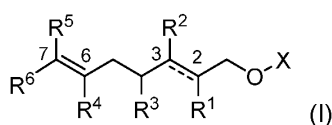
The term propan-2-yl substituted with phenyl, naphthalen-1-yl or naphthalen-2-yl at position 2 means for example 2-(naphthalen-2-yl)propan-2-yl, 2-phenylpropan-2-yl.

- 20 If not further specified, the CC double bond(s) in the compound of formula (I) and the compound of formula (II) has either *E*- or *Z*- configuration, or the compound is a mixture of *E* and *Z* isomers. If more double bonds are present, each of them has either *E*- or *Z*- configuration, and the compound can be present as a pure or enriched isomer, for example as 2*E*,6*Z*-nonadienol, or as a mixture of double bond isomers.

- 25 The compounds of formula (I) and formula (II) can have one or more stereo centers and in consequence exist as different stereoisomers (e.g. diastereomers or enantiomers), all of which are encompassed by the present invention. Chiral compounds of formula (I) or formula (II) can be enantiomerically pure, enriched or racemic. If more than one stereo centre is present, the compounds are either diastereomeric mixtures, diastereomerically enriched or pure diastereomers.

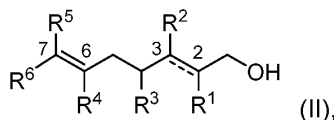
The fragrant alcohols according to formula (II) and their corresponding fragment in the compound of formula (I) vary in the substituents R^1 to R^6 , wherein R^1 , R^3 , R^4 , R^5 and R^6 is independently selected from the group consisting of H, Me and Et, and R^2 is selected from the group consisting of H, Me and Et, or forms together with the carbon atoms C2 and C3 a 3 membered ring, and ----- is indicating a carbon-carbon single or double bond between C2 and C3.

For example, there is provided a compound of formula (I)



wherein

- 10 ----- is indicating a carbon-carbon single or double bond between C2 and C3;
 R^1 , R^3 , R^4 , R^5 and R^6 is independently selected from the group consisting of H, Me and Et;
 R^2 is selected from the group consisting of H, Me and Et, or forms together with the carbon atoms C2 and C3 a 3 membered ring; and
X is selected from the group consisting of
- 15 aryl bearing up to two substituents selected from the group consisting of hydroxy, methoxy, ethoxy, formyl, allyl, oxoalkyl, oxoalkenyl and alkyl alkenoate;
benzyl bearing a substituent selected from the group consisting of formyl, vinyl, (C=O)Me, (C=O)Et, (C=O)OMe, (C=O)OEt, (C=O)Ph at the benzylic position;
propan-2-yl substituted with phenyl, naphthalen-1-yl or naphthalen-2-yl at position 2;
- 20 dimethyl 2-malonate and diethyl 2-malonate; and
alkanoyl (C(O)- R^{10}), with R^{10} selected from linear or branched C_4 to C_{18} alkyl, linear or branched C_4 to C_{18} alkenyl with one or two double bonds, linear or branched C_4 to C_{18} ether and oxoalkyl, and hydroxyphenyl,
with the proviso that the compound is not nona-2,6-dien-1-yl palmitate,
- 25 as precursor for generating a fragrant alcohol of formula (II)



wherein the fragrant alcohol of formula (II) that is released from the compound of formula (I) is selected from the group consisting of 3,7-dimethylnon-6-en-1-ol, 2,4,7-trimethyloct-6-en-1-ol, 6-nonenol, 6-ethyl-3-methyloct-6-en-1-ol, (1-methyl-2-(5-methylhex-4-en-2-yl)cyclopropyl)methanol, and 2,6-nonadienol.

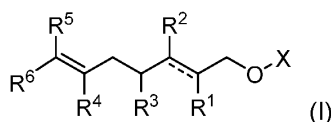
- 5 The fragrant alcohol of formula (II) show a good perception threshold when slowly released from the compound of formula (I). In contrast, other alcohols, for example citronellol (3,7-dimethyloct-6-en-1-ol) or geraniol (3,7-dimethylocta-2,6-dien-1-ol) have higher threshold which are making it difficult to work with in slow release mode, when released from the corresponding compound of formula (I).
- 10 For example, in the compounds of formula (I) and formula (II) the configuration of the double bond between C6 and C7 is *Z*. Alternatively, the configuration of said double bond can be *E*, or the compound can be an *E/Z* mixture.

For example, the fragrant alcohol of formula (II) can be selected from the group consisting of (*Z*)-3,7-dimethylnon-6-en-1-ol, (*S,Z*)-3,7-dimethylnon-6-en-1-ol, 2,4,7-trimethyloct-6-en-1-ol, (*Z*)-6-nonenol, (*Z*)-6-ethyl-3-methyloct-6-en-1-ol, (1-methyl-2-(5-methylhex-4-en-2-yl)cyclopropyl)methanol, and (2*E*,6*Z*)-nonadienol.

In one embodiment of the present invention there is provided a compound of formula (I) as defined above, wherein the sum of carbon atoms provided by R¹ - R⁶ must not exceed 8. In other words, the fragrant alcohol (compound of formula (II)) which can be generated from the compound of formula (I) has a total number of carbon atoms between 9 and 15.

In one embodiment of the present invention there is provided a compound of formula (I) as defined above, with the proviso that if R² is Me, then at least one of R⁵ and R⁶ is H or Et, while the other substituent is independently selected from the group consisting of H, Me and Et.

In one embodiment of the present invention there is provided a compound of formula (I)



wherein

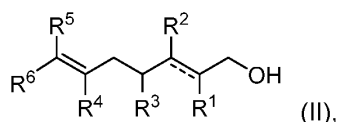
===== is indicating a carbon-carbon single or double bond between C2 and C3;

R^1 , R^3 , R^4 , R^5 and R^6 is independently selected from the group consisting of H, Me and Et;

R^2 is selected from the group consisting of H, Me and Et, or forms together with the carbon atoms C2 and C3 a 3 membered ring; and

X is selected from the group consisting of

- 5 aryl bearing up to two substituents selected from the group consisting of hydroxy, methoxy, ethoxy, formyl, allyl, oxoalkyl, oxoalkenyl and alkyl alkenoate;
- benzyl bearing a substituent selected from the group consisting of formyl, vinyl, (C=O)Me, (C=O)Et, (C=O)OMe, (C=O)OEt, (C=O)Ph at the benzylic position;
- propan-2-yl substituted with phenyl, naphthalen-1-yl or naphthalen-2-yl at position 2;
- 10 dimethyl 2-malonate and diethyl 2-malonate,
- as precursor for generating a fragrant alcohol according to formula (II)



wherein the fragrant alcohol of formula (II) that is released from the compound of formula (I) is selected from the group consisting of 3,7-dimethylnon-6-en-1-ol, 2,4,7-trimethyloct-6-en-1-ol,

- 15 6-nonenol, 6-ethyl-3-methyloct-6-en-1-ol, (1-methyl-2-(5-methylhex-4-en-2-yl)cyclopropyl)methanol, and 2,6-nonadienol.

Said compounds can be referred to as ether type compounds of formula (I).

In one embodiment of the present invention there is provided an ether type compound of formula (I), wherein the sum of carbon atoms provided by R^1 - R^6 must not exceed 8. In other words, the fragrant alcohol (compound of formula (II)) which can be generated from the compound of formula (I) has a total number of carbon atoms between 9 and 15.

In one embodiment of the present invention there is provided an ether type compound of formula (I) as defined above, with the proviso that if R^2 is Me, then at least one of R^5 and R^6 is H or Et, while the other substituent is independently selected from the group consisting of H, Me and Et.

In one embodiment of the present invention there is provided an ether type compound of formula (I), wherein the sum of carbon atoms provided by R^1 - R^6 must not exceed 8, with the

proviso that if R^2 is Me, then at least one of R^5 and R^6 is H or Et, while the other substituent is independently selected from the group consisting of H, Me and Et.

For example, the compound of formula (I) can be selected from the group consisting of 1-((3,7-dimethylnon-6-en-1-yl)oxy)naphthalene, 2-((3,7-dimethylnon-6-en-1-yl)oxy)naphthalene, 4-
 5 ((3,7-dimethylnon-6-en-1-yl)oxy)phenol, ethyl 3-(4-((3,7-dimethylnon-6-en-1-yl)oxy)phenyl)acrylate, 1-((3,7-dimethylnon-6-en-1-yl)oxy)-4-methoxybenzene, 2-((3,7-dimethylnon-6-en-1-yl)oxy)benzaldehyde, 1-((3,7-dimethylnon-6-en-1-yl)oxy)-2-methoxybenzene, 2-((3,7-dimethylnon-6-en-1-yl)oxy)-2-phenylacetaldehyde, 2-((3,7-dimethylnon-6-en-1-yl)oxy)phenol, 3-((3,7-dimethylnon-6-en-1-yl)oxy)phenol, 1-((3,7-dimethylnon-6-en-1-yl)oxy)-3-methoxybenzene, 1-(non-6-en-1-yloxy)naphthalene, 2-(non-6-en-1-yloxy)naphthalene, 4-(non-6-en-1-yloxy)phenol, ethyl 3-(4-((non-6-en-1-yl)oxy)phenyl)acrylate, 1-methoxy-4-(non-6-en-1-yloxy)benzene, 2-(non-6-en-1-yloxy)benzaldehyde, 1-methoxy-2-(non-6-en-1-yloxy)benzene, 3-methoxy-4-(non-6-en-1-yloxy)benzaldehyde, 2-(non-6-en-1-yloxy)phenol, 3-(non-6-en-1-yloxy)phenol, 1-methoxy-3-
 15 (non-6-en-1-yloxy)benzene, 3-ethoxy-4-(non-6-en-1-yloxy)benzaldehyde, 4-((2,4,7-trimethyloct-6-en-1-yl)oxy)phenol, 4-((1-methyl-2-(5-methylhex-4-en-2-yl)cyclopropyl)methoxy)phenol, 1-methoxy-2-((nona-2,6-dien-1-yl)oxy)benzene, 1-((6-ethyl-3-methyloct-6-en-1-yl)oxy)naphthalene, 3-ethoxy-4-((nona-2,6-dien-1-yl)oxy)benzaldehyde, 4-(4-((nona-2,6-dien-1-yl)oxy)phenyl)butan-2-one, 4-allyl-2-methoxy-1-((nona-2,6-dien-1-yl)oxy)benzene, methyl 2-((3,7-dimethylnon-6-en-1-yl)oxy)-2-phenylacetate, 2-((3,7-dimethylnon-6-en-1-yl)oxy)-1,2-diphenylethan-1-one, (2-((3,7-dimethylnon-6-en-1-yl)oxy)propan-2-yl)benzene, and 2-(2-((3,7-dimethylnon-6-en-1-yl)oxy)propan-2-yl)naphthalene.

In a further embodiment of the present invention there is provided a compound of formula (I)



wherein

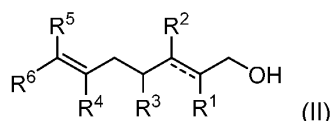
===== is indicating a carbon-carbon single or double bond between C2 and C3;

R^1 , R^3 , R^4 , R^5 and R^6 is independently selected from the group consisting of H, Me and Et;

R^2 is selected from the group consisting of H, Me and Et, or forms together with the carbon atoms C2 and C3 a 3 membered ring; and

30

X is selected from the group consisting of alkanoyl (C(O)-R¹⁰), with R¹⁰ selected from linear or branched C₄ to C₁₈ alkyl, linear or branched C₄ to C₁₈ alkenyl with one or two double bonds, linear or branched C₄ to C₁₈ ether and oxoalkyl, and hydroxyphenyl, with the proviso that the compound is not nona-2,6-dien-1-yl palmitate,
 5 as precursor for generating a fragrant alcohol according to formula (II)



wherein the fragrant alcohol of formula (II) that is released from the compound of formula (I) is selected from the group consisting of 3,7-dimethylnon-6-en-1-ol, 2,4,7-trimethyloct-6-en-1-ol, 6-nonenol, 6-ethyl-3-methyloct-6-en-1-ol, (1-methyl-2-(5-methylhex-4-en-2-yl)cyclopropyl)methanol, and 2,6-nonadienol.
 10

The fragrant alcohol of formula (II) show a good perception threshold when slowly released from the compound of formula (I). In contrast, other alcohols, for example citronellol (3,7-dimethyloct-6-en-1-ol) or geraniol (3,7-dimethylocta-2,6-dien-1-ol) have higher threshold which are making it difficult to work with in slow release mode, when released from the corresponding compound of formula (I).
 15

Said compounds can be referred to as ester type compounds of formula (I).

In one embodiment of the present invention there is provided an ester type compound of formula (I) as defined above, wherein the sum of carbon atoms provided by R¹ - R⁶ must not exceed 8. In other words, the fragrant alcohol (compound of formula (II)) which can be generated from the compound of formula (I) has a total number of carbon atoms between 9 and 15.
 20

In one embodiment of the present invention there is provided an ester type compound of formula (I) as defined above, with the proviso that if R² is Me, then at least one of R⁵ and R⁶ is H or Et, while the other substituent is independently selected from the group consisting of H, Me and Et.
 25

In one embodiment of the present invention there is provided an ester type compound of formula (I), wherein the sum of carbon atoms provided by R¹ - R⁶ must not exceed 8, with the

proviso that if R² is Me, then at least one of R⁵ and R⁶ is H or Et, while the other substituent is independently selected from the group consisting of H, Me and Et.

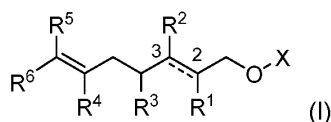
For example, the compound of formula (I) can be selected from the group consisting of 3,7-dimethylnon-6-en-1-yl palmitate, 3,7-dimethylnon-6-en-1-yl 4-oxopentanoate, 2,4,7-trimethyloct-6-en-1-yl palmitate, 2,4,7-trimethyloct-6-en-1-yl 4-oxopentanoate, (1-methyl-2-(5-methylhex-4-en-2-yl)cyclopropyl)methyl palmitate, (1-methyl-2-(5-methylhex-4-en-2-yl)cyclopropyl)methyl 4-oxopentanoate, 6-ethyl-3-methyloct-6-en-1-yl palmitate, 6-ethyl-3-methyloct-6-en-1-yl 4-oxopentanoate, non-6-en-1-yl palmitate, non-6-en-1-yl 4-oxopentanoate, nona-2,6-dien-1-yl 4-oxopentanoate, non-6-en-1-yl 2-hydroxybenzoate, and nona-2,6-dien-1-yl 2-hydroxybenzoate.

The precursor effect of compounds of formula (I) is surprising, since esters are expected to be stable on dry fibers. Thus, the release of fragrant alcohols from esters of formula (I) at a sufficiently high rate to generate a perceivable odour signal is surprising. Furthermore, ethers are considered stable in consumer products and their applications. Thus, the release of perceivable amounts fragrance alcohols from ethers under ambient conditions is surprising.

The compound of formula (I) typically has low odour or is odourless, and is able to release fragrant alcohols of formula (II), which is the dominant odor compound generated by the presented precursor. Typically, the remaining part of the compound of formula (I) is either not contributing to the overall odor at all, or its contribution is relatively small, so that the main odor characteristics of the fragrant alcohols of formula (II) is perceived, and only side aspects of the odor are altered.

However, in some embodiments of the present invention, the compound of formula (I) might have an own odor.

In a further embodiment of the present invention there is provided the use of a compound of formula (I)



wherein

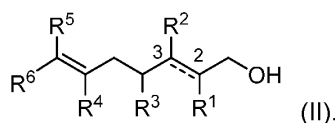
===== is indicating a carbon-carbon single or double bond between C2 and C3;

R^1 , R^3 , R^4 , R^5 and R^6 is independently selected from the group consisting of H, Me and Et;

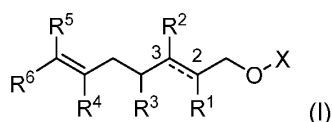
R^2 is selected from the group consisting of H, Me and Et, or forms together with the carbon atoms C2 and C3 a 3 membered ring; and

X is selected from the group consisting of

- 5 aryl bearing up to two substituents selected from the group consisting of hydroxy, methoxy, ethoxy, formyl, allyl, oxoalkyl, oxoalkenyl and alkyl alkenoate;
- benzyl bearing a substituent selected from the group consisting of hydroxymethyl, formyl, vinyl, (C=O)Me, (C=O)Et, (C=O)OMe, (C=O)OEt, (C=O)Ph at the benzylic position;
- propan-2-yl substituted with phenyl, naphthalen-1-yl or naphthalen-2-yl at position 2;
- 10 dimethyl 2-malonate and diethyl 2-malonate; and
- alkanoyl (C(O)- R^{10}), with R^{10} selected from linear or branched C_4 to C_{18} alkyl, linear or branched C_4 to C_{18} alkenyl with one or two double bonds, linear or branched C_4 to C_{18} ether and oxoalkyl, and hydroxyphenyl,
- with the proviso that the compound is not nona-2,6-dien-1-yl palmitate,
- 15 as precursor for generating a fragrant alcohol of formula (II)



For example, there is provided the use the use of a compound of formula (I)



as described above as as precursor for generating a fragrant alcohol of formula (II),

- 20 wherein the fragrant alcohol of formula (II) that is released from the compound of formula (I) is selected from the group consisting of 3,7-dimethylnon-6-en-1-ol, 2,4,7-trimethyloct-6-en-1-ol, 6-nonenol, 6-ethyl-3-methyloct-6-en-1-ol, (1-methyl-2-(5-methylhex-4-en-2-yl)cyclopropyl)methanol, and 2,6-nonadienol.

By the use of the compound of formula (I) instead of the fragrant alcohols as such, it is possible

- 25 to provide the odor of the fragrant alcohols over prolonged time. Furthermore, it is possible to incorporate the precursor into different consumer products.

In addition, compounds of formula (I) release the potent odour of the fragrant alcohols of formula (II) gradually in low concentrations. As some compounds of formula (II) have a high odour impact, they can only be used in very low amounts in fragrance compositions, e.g. below 0.5%. It is thus not possible to dose such fragrant alcohols in sufficient amounts to impact the dry down odour of a rinse-off application such as a laundry detergent application. Compounds of formula (I) solve that technical challenge.

The compounds of formula (I) described above release fragrant alcohols upon exposure to ambient air and/or humidity (by oxidation and/or hydrolysis) over a long period of time (e.g. several days such as 2-7 days or even longer).

10 Exposure of the precursor compound to ambient air means exposure to molecular oxygen which might be responsible for the cleavage of the compound of formula (I) and the release of the compound of formula (II). The concentration of oxygen in the air is sufficient for cleaving the compound of formula (I) so that the cleavage products can be detected in the ambient air, e.g. by olfaction or GC-MS analysis of headspace samples.

15 Exposure of the precursor compound to humidity means exposure to water which might be responsible for the cleavage of the compound of formula (I) and the release of the compound of formula (II). Already traces of water are sufficient to allow for cleavage of the compound of formula (I).

20 The compound of formula (I) is finely dispersed on fibers such as cotton fabric fiber, synthetic textile fiber, hair or hard surfaces such as ceramic or plastic, thereby maximizing the surface and allowing the exposure to air and humidity.

The compounds of formula (I) are very stable when not exposed to ambient air and/or humidity. Thus the compounds of formula (I) may find use in a broad range of consumer products in which a prolonged and defined release of fragrant compounds is desired.

25 The compound of formula (I) may be used alone, or in combination with known odorant molecules selected from the extensive range of natural products, and synthetic molecules currently available, such as essential oils, alcohols, aldehydes and ketones, ethers and acetals, esters and lactones, macrocycles and heterocycles, and/or in admixture with one or more ingredients or excipients conventionally used in conjunction with odorants in fragrance

compositions, for example, carrier materials, and other auxiliary agents commonly used in the art.

For example, the compound of formula (I) may be used in combination with the free fragrant alcohol of formula (II). Such a combination ensures a continuous perception of the fragrant
5 alcohol with time.

In a further aspect, the compound of formula (I) may be used in combination with other fragrance precursors, either with further compounds of formula (I) or with precursors possessing a different chemical structure. A combination of precursors allows releasing a perfume accord.

10 In a further aspect, there is provided a fragrance composition comprising at least one compound of formula (I). For example, the fragrance composition is further comprising one or more known odorant molecules or fragrance precursors, and/or one or more ingredients or excipients conventionally used in conjunction with odorants in fragrance compositions

As used herein, "carrier material" means a material which is practically neutral from an odourant
15 point of view, i.e. a material that does not significantly alter the organoleptic properties of odorants.

The term "auxiliary agent" refers to ingredients that might be employed in a fragrance composition for reasons not specifically related to the olfactive performance of said composition. For example, an auxiliary agent may be an ingredient that acts as an aid to
20 processing a fragrance ingredient or ingredients, or a composition containing said ingredient(s), or it may improve handling or storage of a fragrance ingredient or composition containing same. It might also be an ingredient that provides additional benefits such as imparting color or texture. It might also be an ingredient that imparts light resistance or chemical stability to one or more ingredients contained in a perfume composition. A detailed description of the nature
25 and type of adjuvants commonly used in perfume compositions containing same cannot be exhaustive, but it has to be mentioned that said ingredients are well known to a person skilled in the art.

As used herein, "fragrance composition" means any composition comprising the compound of formula (I) and a base material, e.g. a diluent conventionally used in conjunction with odourants,
30 such as diethyl phthalate (DEP), dipropylene glycol (DPG), isopropyl myristate (IPM), pentane-

1,2-diol, triethyl citrate (TEC) and alcohol (e.g. ethanol). Optionally, the composition may comprise an anti-oxidant adjuvant. Said anti-oxidant may be selected from Tinogard® TT (BASF), Tinogard® Q (BASF), Tocopherol (including its isomers, CAS 59-02-9; 364-49-8; 18920-62-2; 121854-78-2), 2,6-bis(1,1-dimethylethyl)-4-methylphenol (BHT, CAS 128-37-0) and related phenols, hydroquinones (CAS 121-31-9).

The following non limiting list comprises examples of known odourant molecules, which may be combined with the compound of formula (I) in a fragrance composition:

- Essential oils and extracts, e.g. castoreum, costus root oil, oak moss absolute, geranium oil, tree moss absolute, basil oil, fruit oils, such as bergamot oil and mandarine oil, myrtle oil, palmarose oil, patchouli oil, petitgrain oil, jasmine oil, rose oil, sandalwood oil, wormwood oil, lavender oil and/ or ylang-ylang oil;
- Alcohols, e.g. cinnamic alcohol ((*E*)-3-phenylprop-2-en-1-ol); cis-3-hexenol ((*Z*)-hex-3-en-1-ol); Citronellol (3,7-dimethyloct-6-en-1-ol); dihydro myrcenol (2,6-dimethyloct-7-en-2-ol); Ebanol™ ((*E*)-3-methyl-5-(2,2,3-trimethylcyclopent-3-en-1-yl)pent-4-en-2-ol); eugenol (4-allyl-2-methoxyphenol); ethyl linalool ((*E*)-3,7-dimethylnona-1,6-dien-3-ol); farnesol ((2*E*,6*Z*)-3,7,11-trimethyldodeca-2,6,10-trien-1-ol); geraniol ((*E*)-3,7-dimethylocta-2,6-dien-1-ol); Super Muguet™ ((*E*)-6-ethyl-3-methyloct-6-en-1-ol); linalool (3,7-dimethylocta-1,6-dien-3-ol); menthol (2-isopropyl-5-methylcyclohexanol); Nerol (3,7-dimethyl-2,6-octadien-1-ol); phenyl ethyl alcohol (2-phenylethanol); Rhodinol™ (3,7-dimethyloct-6-en-1-ol); Sandalore™ (3-methyl-5-(2,2,3-trimethylcyclopent-3-en-1-yl)pentan-2-ol); terpineol (2-(4-methylcyclohex-3-en-1-yl)propan-2-ol); or Timberol™ (1-(2,2,6-trimethylcyclohexyl)hexan-3-ol); 2,4,7-trimethylocta-2,6-dien-1-ol, and/or [1-methyl-2(5-methylhex-4-en-2-yl)cyclopropyl]-methanol;
- Aldehydes and ketones, e.g. anisaldehyde (4-methoxybenzaldehyde); alpha amyl cinnamic aldehyde (2-benzylideneheptanal); Georgywood™ (1-(1,2,8,8-tetramethyl-1,2,3,4,5,6,7,8-octahydronaphthalen-2-yl)ethanone); Hydroxycitronellal (7-hydroxy-3,7-dimethyloctanal); Iso E Super® (1-(2,3,8,8-tetramethyl-1,2,3,4,5,6,7,8-octahydronaphthalen-2-yl)ethanone); Isoraldeine® ((*E*)-3-methyl-4-(2,6,6-trimethylcyclohex-2-en-1-yl)but-3-en-2-one); Hedione® (methyl 3-oxo-2-pentylcyclopentaneacetate); Nymphaeal (3-(4-isobutyl-2-methylphenyl)propanal); Mahonial (5,9-dimethyl-9-hydroxy-decen-4-al); maltol; methyl cedryl ketone; methylionone; verbenone; and/or vanillin;

- Ether and acetals, e.g. Ambrox® (3a,6,6,9a-tetramethyl-2,4,5,5a,7,8,9,9b-octahydro-1*H*-benzo[*e*][1]benzofuran); geranyl methyl ether ((2*E*)-1-methoxy-3,7-dimethylocta-2,6-diene); rose oxide (4-methyl-2-(2-methylprop-1-en-1-yl)tetrahydro-2*H*-pyran); and/or Spirambrene® (2',2',3,7,7-pentamethylspiro[bicyclo[4.1.0]heptane-2,5'-[1,3]dioxane]);
- Esters and lactones, e.g. benzyl acetate; cedryl acetate ((1*S*,6*R*,8*aR*)-1,4,4,6-tetramethyloctahydro-1*H*-5,8a-methanoazulen-6-yl acetate); γ -decalactone (6-pentyltetrahydro-2*H*-pyran-2-one); Helvetolide® (2-(1-(3,3-dimethylcyclohexyl)ethoxy)-2-methylpropyl propionate); γ -undecalactone (5-heptyloxolan-2-one); and / or vetiveryl acetate ((4,8-dimethyl-2-propan-2-ylidene-3,3a,4,5,6,8a-hexahydro-1*H*-azulen-6-yl) acetate
- Macrocycles, e.g. Ambrettolide ((*Z*)-oxacycloheptadec-10-en-2-one); ethylene brassylate (1,4-dioxacycloheptadecane-5,17-dione); and / or Exaltolide® (16-oxacyclohexadecan-1-one); and
- Heterocycles, e.g. isobutylquinoline (2-isobutylquinoline).

Overall, the compounds of formula (I) can be used alone, as a mixture thereof, or in combination with other fragrance ingredients and/or precursors thereof. Such other fragrance ingredients are also described, for example, in "Perfume and Flavor Chemicals", S. Arctander, Ed., Vol. I & II, Allured Publishing Corporation, Carol Stream, USA, 2003 and include fragrance compounds of natural or synthetic origin and essential oils.

In a further aspect, there is provided a consumer product comprising at least one compound of formula (I) and a consumer product base.

The consumer product for example is selected from fine fragrance, personal care products (body care products, hair care products, cosmetic products) fabric care products, home care products and air care products. As used herein, "consumer product base" means a composition for use as a consumer product to fulfill specific actions, such as cleaning, softening, and caring or the like.

Personal care products to which the compound of formula (I) can be added include for example all kinds of body care products. Especially interesting products are hair care products, for example shampoos, conditioners and hairsprays, and skin care products, like lotions or

creams. Furthermore, the compound of formula (I) may be added to soaps, bath and shower gels and deodorants. The compound of formula (I) can be added to cosmetic products.

Home care products to which the compound of formula (I) can be added include all kinds of detergents, window cleaners, hard surface cleaners, all-purpose cleaners and furniture
5 polishes. Preferably, the products are liquids, e.g. fabric detergent or conditioner compositions.

For example, the compounds of formula (I) can act as fragrance precursors in consumer products which further comprise enzymes.

The compound according to formula (I) may be used in a broad range of perfumed consumer products, e.g. in any field of fine and functional perfumery, such as perfumes, air care products,
10 household products, laundry products, body care products and cosmetics. The compound can be employed in widely varying amounts, depending upon the specific consumer product and on the nature and quantity of other odourant ingredients. The proportion of the formula (I) is typically from 0.0001 to 5 weight% of the consumer product. In one embodiment, the compound of formula (I) may be employed in a fabric softener in an amount from 0.001 to 0.3 weight %
15 (e.g. 0.01 to 0.1 including 0.05 weight%). In another embodiment, the compound of formula (I) may be used in fine perfumery but also in consumer products like shampoo, fabric softener or fabric detergents, in amounts from 0.001 to 30 weight% (e.g. up to about 10 or up to 20 weight%), more preferably between 0.01 and 5 weight%. However, these values are given only by way of example, since the experienced perfumer may also achieve effects or may create
20 novel accords with lower or higher concentrations.

In one embodiment there is provided a consumer product comprising an acceptable amount of the compound of formula (I). For example, the fragranced consumer product may comprise 0.000001 weight% to 90 weight% (including 0.00001 weight %; 0.0001 weight%, 0.001 weight%, 0.01 weight%, 0.05 weight%, 0.1 weight%, 0.5 weight%, 1 weight%, 5 weight%, 8
25 weight%, 10 weight%, 15 weight%, 20 weight%, 25 weight%, 30 weight%, 50 weight%, 60 weight%, 65 weight%) of the compound of formula (I) based on the total amount of the consumer product.

The compound of formula (I) may be employed in a consumer product base simply by directly mixing the compound of the present invention, or a fragrance composition comprising the
30 compound of formula (I), with the consumer product base, or it may, in an earlier step, be entrapped with an entrapment material, for example, polymers, capsules, microcapsules and

nanocapsules, liposomes, film formers, absorbents such as carbon or zeolites, cyclic oligosaccharides and mixtures thereof, and then mixed with the consumer product base. The consumer base might further contain entrapment material able to release other fragrant compounds.

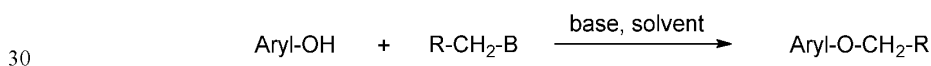
- 5 Thus, the invention additionally provides a method of manufacturing a consumer product, comprising the incorporation of a compound of formula (I) either by directly admixing it to the consumer product base or by admixing a fragrance composition comprising the compound of formula (I), which may then be mixed with a consumer product base, using conventional techniques and methods. Through the addition of an acceptable amount of the compound of
- 10 the present invention as hereinabove described, the odour notes of an applied consumer product will be improved, conferred, enhanced, or modified.

As used herein, 'consumer product base' means a composition for use as a consumer product to fulfil specific actions, such as cleaning, softening, and caring or the like.

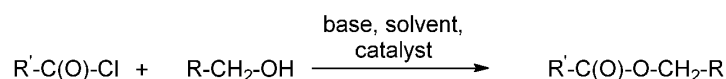
- In a further aspect of the present invention, there is provided a method to release a a fragrant alcohol of formula (II), wherein a compound of formula (I) according to claim 1 is exposed to ambient air and/or humidity.
- 15

- The compounds of the current invention can be prepared by methods known to the person skilled in the art of organic synthesis. For the purpose of illustration, descriptions of general methods are provided in the following. In all cases, isolation and purification of the product is effected according to suitable workup and purification methods known to the person skilled in the art.
- 20

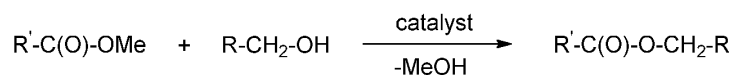
- For example, compounds of formula (I) of the ether type, wherein X is selected from the group consisting of aryl bearing up to two substituents selected from the group consisting of hydroxy, methoxy, ethoxy, formyl, allyl, oxoalkyl, oxoalkenyl and alkyl alkenoate, may be prepared by reaction of a phenol or hydroxynaphtalene (Aryl-OH) with substituted alkyl "R-CH₂-B", B being
- 25 a chloride, bromide, iodide, tosylate or a mesylate, in the presence of a base, such as potassium carbonate, in a solvent, such as dimethyl formamide (DMF), at a temperature between 25°C and 150°C, for a time period between 1 and 24 h.



For example, compounds of formula (I) of the ester type, wherein X is selected from the group consisting of alkanoyl (C(O)-R¹⁰), with R¹⁰ selected from linear or branched C₄ to C₁₈ alkyl, linear or branched C₄ to C₁₈ alkenyl with one or two double bonds, linear or branched C₄ to C₁₈ ether and oxoalkyl, and hydroxyphenyl may be prepared by reaction of a carboxylic acid chloride "R'-C(O)-Cl" with an alcohol "R-CH₂-OH" in the presence of a base, such as pyridine, triethyl amine, potassium carbonate or sodium hydroxide, optionally in the presence of 1-10 mol% of a catalyst, such as 4-(N,N-dimethylamino)pyridine, in a solvent, such as dichloromethane, toluene or heptane, at a temperature between 0°C and 100°C, for a time period between 1-48 h.



Alternatively, compounds of formula (I) of the ester type, R'-C(O)-O-CH₂-R may be prepared by a transesterification reaction between a carboxylic acid ester "R'-C(O)-O(Me, Et)" and an alcohol "R-CH₂-OH" in the presence of 1-20 mol% of a catalyst such as titanium tetraisopropoxide, under reduced pressure and distillation of the alcohol MeOH or EtOH, preferably without solvent, at a temperature between 50-200°C.



The invention furthermore provides in another aspect a method to confer, enhance, improve or modify the hedonic properties of a fragrance composition or a consumer product, which method comprises adding to said composition or consumer product at least one compound of formula (I).

The invention is now further described with reference to the following non-limiting examples. These examples are for the purpose of illustration only and it is understood that variations and modifications can be made by one skilled in the art.

EXAMPLES

General: All reagents and reaction solvents were analytical grade, purchased from commercial suppliers and used without further purification. Reactions were monitored by GC-FID (Zebron ZB-5 GC capillary column, 12 m x, 0.32 mm x 0.25 μ m, or Zebron ZB-wax, 15 m x, 0.32 mm x 0.25 μ m). Flash column chromatography was performed on Biotage silica gel prepacked columns (particle size 20 μ m) with the indicated eluents, flow 50 mL/min. All reported yields, unless otherwise specified, refer to spectroscopically and chromatographically pure isolated compounds; isomeric ratios are indicated if appropriate. Routine NMR spectra were recorded on Bruker Avance III HD (500 MHz) and AW 400 MHz Bruker, 2D NMR spectra were recorded on Bruker Avance-III 600 MHz with 1.7 mm TCI-microcryoprobe). Proton chemical shifts are reported in ppm (δ) relative to tetramethylsilane (TMS) with the solvent resonance employed as the internal standard (CDCl_3 δ 7.27 ppm). Data are reported as follows: chemical shift, multiplicity (s = singlet, d = doublet, t = triplet, q = quartet, p = pentet, sext = sextet, h = heptet, m = multiplet, br = broad), coupling constants (Hz) and integration. ^{13}C chemical shifts are reported in ppm from tetramethylsilane (TMS) with the solvent resonance as the internal standard (CDCl_3 δ 77.0 ppm;).

Example 1: 3,7-dimethylnon-6-en-1-yl 4-oxopentanoate

The mixture of 3,7-dimethylnon-6-en-1-ol (E/Z mixture, 6.39 g, 37.5 mmol, 1.5 equiv.), methyl 4-oxopentanoate (3.25 g, 25.0 mmol, 1 equiv.) and titanium(IV) isopropoxide (355 mg, 1.25 mmol, 5 mol%) was placed in a 2-necked 25 mL glass flask, which was equipped with a distillation apparatus with a 6 cm Vigreux column. The mixture was heated under stirring to 110°C under reduced pressure (500 mbar) for 40 min, then at 130°C at 350 mbar for 2.5 h. After cooling to RT, the crude product was purified by FC (heptane/EtOAc, gradient from 0% to 100% EtOAc). The resulting product was subjected to bulb-to-bulb distillation (100°C/0.11 mbar) to remove excess 3,7-dimethylnon-6-en-1-ol. The residue consisted of 3,7-dimethylnon-6-en-1-yl 4-oxopentanoate (colourless liquid, 4.79 g, 69%, E/Z 69:31, purity >97%).

^1H -NMR (500 MHz, CDCl_3) 5.04 - 5.12 (m, 1 H), 4.07 - 4.15 (m, 2 H), 2.73 - 2.77 (m, 2 H), 2.56 - 2.59 (m, 2 H), 2.20 (s, 3 H), 1.91 - 2.07 (m, 3 H), 1.68 (q, J = 1.2 Hz, 0.5 H), 1.62 - 1.73 (m, 1 H), 1.60 (br. s, 2.5 H), 1.50 - 1.59 (m, 1 H), 1.31 - 1.48 (m, 3 H), 1.14 - 1.23 (m, 1 H), 0.98 (q, J = 7.6 Hz, 3H), 0.91 (dd, J = 6.7, 2.1 Hz, 3H). ^{13}C -NMR (126 MHz, CDCl_3) 206.6 (s), 172.8 (s), 137.1, 136.8 (s), 124.2, 122.9 (d), 63.3, 63.2 (d), 38.0 (t), 37.3, 37.0 (t), 35.4 (t), 32.3 (t), 29.9, 29.5 (d), 28.0 (t), 25.2, 24.7 (t), 22.9 (q), 19.4, 19.4 (q), 15.9 (q), 12.8, 12.8 (q).

Example 2: (E/Z)-3,7-dimethylnon-6-en-1-yl palmitate

The procedure described in Example 1 was repeated with 3,7-dimethylnon-6-en-1-ol (E/Z mixture, 3.8 g, 23 mmol, 1.5 equiv.), methyl palmitate (4.1 g, 15.0 mmol, 1 equiv.) and titanium(IV) isopropoxide (210 mg, 0.75 mmol, 5 mol%) to yield after chromatographic purification the product as a colourless liquid (4.2 g, 66%, E/Z 62:35).

¹H-NMR (500 MHz, CDCl₃) 5.07 - 5.12 (m, 1 H), 4.09 - 4.15 (m, 2 H), 2.30 (t, J=7.6 Hz, 2 H), 1.96 - 2.06 (m, 4 H), 1.55 - 1.71 (m, 5 H), 1.62 (br. s, 3H), 1.43 - 1.48 (m, 1 H), 1.19 - 1.41 (m, 25 H), 0.99 (q, J=7.6 Hz, 3 H), 0.92 - 0.95 (m, 3 H), 0.90 (t, J=7.3 Hz, 3 H). ¹³C-NMR (126 MHz, CDCl₃) 174.0 (s), 137.1, 136.8 (s), 124.2, 123.0 (d), 62.8 (t), 37.3 (t), 37.0 (t), 35.5 (t), 34.5 (t), 32.4 (t), 31.9 (t), 29.7 (4t), 29.6 (t), 29.5 (d), 29.5 (t), 29.4 (t), 29.3 (t), 29.2 (t), 25.3, 25.0 (t), 25.0, 24.8 (t), 22.7 (t), 19.5, 19.4 (q), 15.9 (q), 14.1 (q), 12.9, 12.8 (q).

Example 3: 2,4,7-trimethyloct-6-en-1-yl 4-oxopentanoate

The procedure described in Example 1 was repeated with 2,4,7-trimethyloct-6-en-1-ol (5.1 g, 30 mmol, 1.5 equiv.), 4-oxopentanoate (2.6 g, 20.0 mmol, 1 equiv.) and titanium(IV) isopropoxide (284 mg, 1.0 mmol, 5 mol%) to yield after chromatographic purification the product as a colourless liquid (3.6 g, 67%, 2 diastereomers, d.r. 56:43).

¹H-NMR (500 MHz, CDCl₃) 5.10 - 5.15 (m, 1 H), 3.91 - 4.00 (m, 1 H), 3.81 - 3.87 (m, 1 H), 2.75 - 2.78 (m, 2 H), 2.58 - 2.62 (m, 2 H), 2.21 (s, 3 H), 1.83 - 2.00 (m, 2 H), 1.71 (br. s, 3 H), 1.60 (br. s, 3 H), 1.55 (dq, J = 13.4, 6.7 Hz, 1 H), 1.33 (dt, J = 13.7, 6.9 Hz, 1 H), 1.12 - 1.16 (m, 1 H), 0.95 - 1.02 (m, 1 H), 0.93 (d, J = 6.7 Hz, 1 H), 0.89 (dd, J = 8.9, 6.7 Hz, 3 H), 0.85 (d, J = 6.4 Hz, 2 H). ¹³C-NMR (126 MHz, CDCl₃) 206.6 (2s), 172.8 (2s), 132.2 (s), 123.1, 122.9 (d), 70.2, 69.6 (t), 40.8, 40.4 (t), 38.0 (t), 36.1, 35.0 (t), 30.9, 30.8 (d), 30.1 (2d), 29.9 (q), 28.0 (t), 25.8, 25.8 (q), 20.1, 19.2 (q), 17.9, 17.7 (q), 16.6 (q).

Example 4: (1-methyl-2-(5-methylhex-4-en-2-yl)cyclopropyl)methyl 4-oxopentanoate

The procedure described in Example 1 was repeated with (1-methyl-2-(5-methylhex-4-en-2-yl)cyclopropyl)methanol (4.1 g, 22.5 mmol, 1.5 equiv.), 4-oxopentanoate (2.0 g, 15.0 mmol, 1 equiv.) and titanium(IV) isopropoxide (213 mg, 0.75 mmol, 5 mol%) to yield after chromatographic purification the product as a colourless liquid (2.3 g, 54%, 2 diastereomers, d.r. 61:32).

¹H-NMR (500 MHz, CDCl₃) 5.10 - 5.19 (m, 1 H), 3.78 - 3.88 (m, 2 H), 2.73 - 2.78 (m, 2 H), 2.57 - 2.65 (m, 2 H), 2.19 (s, 3 H), 2.01 - 2.14 (m, 1 H), 1.90 - 1.99 (m, 1 H), 1.69 - 1.72 (m, 3 H), 1.61 (s, 3 H), 1.13 - 1.15 (m, 1 H), 1.12 (s, 2 H), 0.99 - 1.10 (m, 2 H), 0.92 - 0.98 (m, 2 H), 0.47 - 0.62 (m, 2 H), -0.01 - 0.12 (m, 1 H). ¹³C-NMR (126 MHz, CDCl₃) 206.6 (2s), 172.9 (2s), 132.0,

131.8 (s), 123.0, 122.9 (d), 74.0, 73.9 (t), 38.0 (2t), 35.7, 35.5 (t), 34.6, 34.1 (d), 29.9 (q), 29.5, 29.4 (d), 28.0 (2t), 25.9, 25.8 (q), 20.1, 19.9 (q), 19.9, 19.1 (s), 17.8 (q), 16.8, 16.1 (t), 15.7 (q).

Example 5: (Z)-non-6-en-1-yl 4-oxopentanoate

The procedure described in Example 1 was repeated with (Z)-non-6-en-1-ol (4.3 g, 30.0 mmol, 1.5 equiv.), 4-oxopentanoate (2.6 g, 20.0 mmol, 1 equiv.) and titanium(IV) isopropoxide (284 mg, 1.0 mmol, 5 mol%) to yield after chromatographic purification the product as a colourless liquid (3.4 g, 70%).

¹H-NMR (500 MHz, CDCl₃) 5.27 - 5.39 (m, 2 H), 4.06 (t, *J*=6.7 Hz, 2 H), 2.74 (t, *J*=6.4 Hz, 2 H), 2.57 (t, *J*=6.7 Hz, 2 H), 2.19 (s, 3 H), 1.97 - 2.06 (m, 4 H), 1.59 - 1.66 (m, 2 H), 1.31 - 1.40 (m, 4 H), 0.95 (t, *J*=7.6 Hz, 3 H). ¹³C-NMR (126 MHz, CDCl₃) 206.6 (s), 172.8 (s), 131.8 (d), 128.8 (d), 64.8 (t), 37.9 (t), 29.9 (q), 29.3 (t), 28.5 (t), 28.0 (t), 26.9 (t), 25.5 (t), 20.5 (t), 14.4 (q).

Example 6: 2-((3,7-dimethylnon-6-en-1-yl)oxy)naphthalene

a) 9-bromo-3,7-dimethylnon-3-ene

Tribromophosphane (55.6 g, 0.21 mol, 0.35 equiv.) was added dropwise at 5°C to the stirred mixture of 3,7-dimethylnon-6-en-1-ol (E/Z mixture, 100 g, 0.59 mol, 1.5 equiv.) and pyridine (9.3 g, 0.12 mol, 0.2 equiv.). Stirring was continued at 2-10°C for 1 h, then the mixture was poured on water (300 mL). The organic layer was washed with water and brine and dried over MgSO₄. The crude product (126 g of a slightly turbid liquid) was distilled over a 10 cm Vigreux column (bath 160°C, head 100°C) to yield a colourless oil (78.8 g, 58%).

b) 2-((3,7-dimethylnon-6-en-1-yl)oxy)naphthalene

To the solution of naphthalene-2-ol (2.0 g, 14 mmol, 1 equiv.) in N,N-dimethyl formamide (DMF, 50 mL) was added potassium carbonate (3.8 g, 28 mmol, 2 equiv.) and the mixture was stirred at RT for 20 min. The above prepared 9-bromo-3,7-dimethylnon-3-ene (3.9 g, 17 mmol, 1.2 equiv.) was added and the resulting mixture was stirred at 95°C for 6 h. Workup was effected as described above in part a). The crude product was purified by FC on SiO₂ (heptane/MTBE 60:1) to the product as a colourless oil (0.8 g, 20%, 3 isomers 50:36:12).

¹H-NMR (500 MHz, CDCl₃) 7.75 - 7.82 (m, 3 H), 7.47 (ddd, *J*=8.1, 6.9, 1.3 Hz, 1 H), 7.34 - 7.39 (m, 1 H), 7.18 (s, 1 H), 7.19 (d, *J*=8.6 Hz, 1 H), 5.13 - 5.29 (m, 1 H), 4.10 - 4.20 (m, 2 H), 1.89 - 2.14 (m, 4 H), 1.60 - 1.84 (m, 7 H), 1.38 - 1.55 (m, 2 H), 1.22 - 1.36 (m, 1 H), 0.95 - 1.08 (m, 4 H).

Example 7: 2-((3,7-dimethylnon-6-en-1-yl)oxy)phenol

The mixture of 1,2-dihydroxybenzene (2.0 g, 18 mmol, 1 equiv.), potassium carbonate (5.0 g, 36 mmol, 2 equiv.) and 9-bromo-3,7-dimethylnon-3-ene (as prepared in Example 6a, 5.1 g, 22 mmol, 1.2 equiv.) in DMF (50 mL) was heated to 80°C under stirring for 20 h. The mixture was poured on water (100 mL), acidified with 2M aq. HCl-solution and extracted with heptane. After drying over MgSO₄ and evaporation of the solvent, a clear brown liquid was obtained (3.7 g), which was purified by FC on SiO₂ (heptane/MTBE 30:1) to yield the product as a colourless oil (1.8 g, 36%, mixture of E/Z-isomers).

¹H-NMR (500 MHz, CDCl₃) 6.96 - 6.99 (m, 1 H), 6.85 - 6.94 (m, 3 H), 5.70 (s, 1 H), 5.02 - 5.42 (m, 1 H), 4.07 - 4.15 (m, 2 H), 1.99 - 2.11 (m, 2 H), 1.87 - 1.94 (m, 1 H), 1.60 - 1.76 (m, 6 H), 1.21 - 1.51 (m, 3 H), 0.98 - 1.06 (m, 6 H).

Example 8: 2-((3,7-dimethylnon-6-en-1-yl)oxy)benzaldehyde

The procedure described for Example 7 was repeated with salicylaldehyde (2.0 g, 16 mmol, 1 equiv.), potassium carbonate (4.5 g, 32 mmol, 2 equiv.) and 9-bromo-3,7-dimethylnon-3-ene (as prepared in Example 6a, 4.6 g, 20 mmol, 1.2 equiv.) in DMF (50 mL). After purification of the crude by FC on SiO₂ (heptane/MTBE 30:1) the product was isolated as a colourless oil (4.0 g, 88%, mixture of E/Z-isomers).

¹H-NMR (500 MHz, CDCl₃) 10.52 (s, 1 H), 7.84 (dd, J=7.7, 1.8 Hz, 1 H), 7.54 (ddd, J=8.3, 7.5, 1.8 Hz, 1 H), 6.98 - 7.04 (m, 2 H), 5.03 - 5.30 (m, 1 H), 4.10 - 4.16 (m, 2 H), 1.88 - 2.08 (m, 4 H), 1.56 - 1.77 (m, 6 H), 1.19 - 1.48 (m, 2 H), 0.96 - 1.02 (m, 6 H).

Example 9: 2-((3,7-dimethylnon-6-en-1-yl)oxy)-2-phenylethan-1-ol

To the mixture of styrene oxide (10.0 g, 83 mmol, 1 equiv., added in 2 portions after 0 and 24 h) and (E,Z)-3,7-dimethylnon-6-en-1-ol (14.2 g, 83 mmol, 1 equiv) was added FeCl₃ (0.63 g, 4.1 mmol, 5 mol% added in 2 portions after 0 and 24 h). The mixture was stirred for 48 hours at 60°C, then poured on sat. aq. NaHCO₃-solution (100 mL) and extracted with MTBE. The organic layer was washed with water and brine and dried over MgSO₄. After removal of the solvent, a clear dark brown liquid was obtained (13.1 g), which was bulb-to-bulb distilled (180°C, 0.05 mbar) and purified by FC on SiO₂ (heptane/MTBE 3:1) to obtain the product as a slightly yellow liquid (2.98 g, 27%, mixture of E and Z isomers).

¹H-NMR (400 MHz, CDCl₃) 7.27 - 7.43 (m, 5 H), 5.05 - 5.14 (m, 1 H), 4.42 (dd, J=8.4, 4.0 Hz, 1 H), 3.57 - 3.75 (m, 2 H), 3.35 - 3.56 (m, 2 H), 2.36 (dd, J=9.4, 3.1 Hz, 1 H), 1.93 - 2.08 (m, 3 H), 1.54 - 1.73 (m, 5 H), 1.26 - 1.49 (m, 3 H), 1.10 - 1.24 (m, 1 H), 0.84 - 1.05 (m, 6 H).

Example 10: 2-((3,7-dimethylnon-6-en-1-yl)oxy)-2-phenylacetaldehyde

The product of Example 9 (1.0 g, 3.4 mmol) was oxidized with Dess-Martin-periodinane (1.1 equiv.) in dichloromethane (50 mL) to yield, after FC on SiO₂ (heptane/MTBE 9:1), the product as a colourless liquid (0.27 g, 27%, mixture of E and Z isomers).

¹H-NMR (400 MHz, CDCl₃) 9.62 (d, *J*=2.2 Hz, 1 H), 7.28 - 7.68 (m, 5 H), 5.01 - 5.14 (m, 1 H),
5 4.71 - 4.75 (m, 1 H), 3.45 - 3.75 (m, 2 H), 1.83 - 2.07 (m, 3 H), 1.79 (br. s, 3 H), 1.63 - 1.81
(m, 2 H), 1.45 - 1.60 (m, 1 H), 1.13 - 1.43 (m, 3 H), 0.80 - 1.04 (m, 6 H).

Example 11: (2E,6Z)-nona-2,6-dien-1-yl 2-hydroxybenzoate

The mixture of methyl salicylate (4.0 g, 26.3 mmol, 1 equiv), 2E,6Z-nona-2,6-dien-1-ol (18.4 g, 131 mmol, 5 equiv) und sodium methoxide (0.14 g, 2.6 mmol, 0.1 equiv.) was stirred for 3 h at
10 85°C. The mixture was poured on 2 N aq. HCl-solution (100 mL), then extracted with MTBE. The organic layer was washed with water and brine and dried over MgSO₄. The residue obtained after removal of the solvent was bulb-to-bulb distilled (100°C/0.08 mbar) to yield the product as a clear, colourless liquid (3.81 g, 56%).

¹H-NMR (400 MHz, CDCl₃) 10.83 (s, 1 H), 7.89 (dd, *J*=8.2, 1.6 Hz, 1 H), 7.47 (ddd, *J*=8.5, 7.2,
15 1.7 Hz, 1 H), 7.00 (dd, *J*=8.3, 1.0 Hz, 1 H), 6.90 (t, *J*=7.6 Hz, 1 H), 5.87 - 5.95 (m, 1 H), 5.67 - 5.77 (m, 1 H), 5.31 - 5.54 (m, 2 H), 4.82 (dd, *J*=6.5, 0.9 Hz, 2 H), 1.99 - 2.26 (m, 6 H), 0.98 (t, *J*=7.5 Hz, 3 H). ¹³C-NMR (100 MHz, CDCl₃) 170.0 (s), 161.7 (s), 136.7 (d), 135.6 (d), 132.4 (d), 130.0 (d), 127.8 (d), 123.5 (d), 119.1 (d), 117.5 (d), 112.6 (s), 66.0 (t), 32.4 (t), 26.5 (t), 20.6 (t), 14.3 (q).

20 Example 12: 4-allyl-2-methoxy-1-(((2E,6Z)-nona-2,6-dien-1-yl)oxy)benzene

a) (2E,6Z)-1-bromonona-2,6-diene

Tetrabromomethane (92.2 g, 0.28 mol, 1.3 equiv.) was added dropwise at 5°C to the stirred solution of (2E,6Z)-nona-2,6-dien-1-ol (30 g, 0.21 mol, 1 equiv.) and triphenylphosphane (72.9 g, 0.28 mol, 1.3 equiv.) in dichloromethane (400 mL). Stirring was continued at room
25 temperature for 1 h, then the solvent was evaporated and pentane (250 mL) was added. The mixture was placed in a refrigerator over night, then the formed precipitate was filtered off and the filtrate was concentrated to yield (2E,6Z)-1-bromonona-2,6-diene as a yellow liquid (45.1 g, >99%).

b) 4-allyl-2-methoxy-1-(((2E,6Z)-nona-2,6-dien-1-yl)oxy)benzene

30 The mixture of eugenol (5.0 g, 28 mmol, 1 equiv.), (2E,6Z)-1-bromonona-2,6-diene (as prepared above, 6.3 g, 31 mmol, 1.1 equiv.), potassium carbonate (9.7 g, 70 mmol, 2.5 equiv.)

and DMF (70 mL) was stirred at 80°C for 7 h. Usual workup and chromatography (heptane/MTBE 30:1) yielded the product as a yellow liquid (1.75 g, 39%).

¹H-NMR (400 MHz, CDCl₃) 6.81 (d, *J*=7.9 Hz, 1 H), 6.67 - 6.72 (m, 2 H), 5.96 (ddt, *J*=16.9, 10.1, 6.7, 6.7 Hz, 1 H), 5.69 - 5.87 (m, 2 H), 5.24 - 5.44 (m, 2 H), 5.03 - 5.13 (m, 2 H), 4.51 (d, *J*=5.4 Hz, 2 H), 3.85 (s, 3 H), 3.33 (d, *J*=6.6 Hz, 2 H), 1.98 - 2.20 (m, 6 H), 0.95 (t, *J*=7.5 Hz, 3 H). ¹³C-NMR (101 MHz, CDCl₃) 149.4 (s), 146.5 (s), 137.7 (d), 135.0 (d), 132.9 (s), 132.2 (d), 128.1 (d), 125.4 (d), 120.3 (d), 115.6 (t), 113.5 (d), 112.1 (d), 69.9 (t), 55.8 (d), 39.8 (t), 32.4 (t), 26.6 (t), 20.6 (t), 14.3 (q).

Example 13: 4-(4-(((2E,6Z)-nona-2,6-dien-1-yl)oxy)phenyl)butan-2-one

The procedure described in Example 12 was repeated with 4-(4-hydroxyphenyl)butan-2-one (5.0 g, 28 mmol, 1 equiv.), (2E,6Z)-1-bromonona-2,6-diene (6.3 g, 31 mmol, 1.1 equiv.), potassium carbonate (9.7 g, 70 mmol, 2.5 equiv.) and DMF (70 mL) to yield the product as a clear, yellow liquid (2.15 g, 43%).

¹H-NMR (400 MHz, CDCl₃) 6.99 - 7.10 (m, 2 H), 6.77 - 6.88 (m, 2 H), 5.78 - 5.93 (m, 1 H), 5.67 - 5.76 (m, 1 H), 5.26 - 5.44 (m, 2 H), 4.42 - 4.46 (m, 2 H), 2.80 - 2.86 (m, 2 H), 2.69 - 2.74 (m, 2 H), 1.94 - 2.22 (m, 9 H), 0.96 (t, *J*=7.5 Hz, 3 H). ¹³C-NMR (101 MHz, CDCl₃) 208.2 (s), 157.1 (s), 134.9 (d), 133.1 (s), 132.3 (d), 129.2 (2d), 128.0 (d), 125.3 (d), 114.8 (2d), 68.8 (t), 45.5 (t), 32.4 (t), 30.1 (q), 28.9 (t), 26.6 (t), 20.6 (t), 14.32 (q).

Example 14: (Z)-3-ethoxy-4-(non-6-en-1-yloxy)benzaldehyde

(Z)-9-bromonon-3-ene was prepared from (Z)-non-6-en-1-ol according to the procedure described in Example 12a. The title compound was prepared from ethylvanillin and (Z)-9-bromonon-3-ene according to the procedure described in Example 12b. Purification by FC (heptane/MTBE 6:1) yielded a clear, slightly yellow liquid (4.44 g).

¹H-NMR (400 MHz, CDCl₃) 9.84 (s, 1 H), 7.43 (d, *J*=8.1 Hz, 1 H), 7.41 (s, 1 H), 6.97 (d, *J*=8.3 Hz, 1 H), 5.32 - 5.45 (m, 2 H), 4.08 - 4.18 (m, 4 H), 1.99 - 2.11 (m, 4 H), 1.85 - 1.93 (m, 2 H), 1.48 (t, *J*=7.1 Hz, 5 H), 1.41-1.55 (m, 1 H), 1.27 - 1.32 (m, 1 H), 0.92 - 0.99 (m, 3 H). ¹³C-NMR (101 MHz, CDCl₃) 190.9 (d), 154.5 (s), 149.2 (s), 131.9 (d), 129.9 (s), 128.8 (d), 126.6 (d), 111.8 (d), 110.9 (d), 69.1 (t), 64.6 (t), 29.4 (t), 28.8 (t), 27.0 (t), 25.5 (t), 20.5 (t), 14.7 (q), 14.4 (q).

Example 15: (Z)-2-(non-6-en-1-yloxy)naphthalene

The procedure described in Example 14 was repeated with (Z)-9-bromonon-3-ene (17 mmol) and naphthalen-2-ol (14 mmol). The product was obtained as a clear colourless liquid (3.1 g, 77%) after column chromatographic purification (heptane/MTBE 60:1).

¹H-NMR (400 MHz, CDCl₃) 7.80 - 7.86 (m, 3 H), 7.52 (ddd, *J*=8.3, 6.9, 1.2 Hz, 1 H), 7.39 - 7.44 (m, 1 H), 7.24 - 7.28 (m, 1 H), 7.21 (d, *J*=2.4 Hz, 1 H), 5.43 - 5.54 (m, 2 H), 4.14 (t, *J*=6.6 Hz, 2 H), 2.12 - 2.22 (m, 4 H), 1.91 - 1.98 (m, 2 H), 1.51 - 1.66 (m, 4 H), 1.08 (t, *J*=7.6 Hz, 3 H). ¹³C-NMR (101 MHz, CDCl₃) 157.2 (s), 134.7 (s), 131.9 (d), 129.4 (d), 129.0 (d), 129.0 (s), 127.7 (d), 126.8 (d), 126.3 (d), 123.5 (d), 119.1 (d), 106.6 (d), 68.0 (t), 29.6 (t), 29.3 (t), 27.1 (t), 25.9 (t), 20.7 (t), 14.5 (q).

10 Example 16: methyl 2-((3,7-dimethylnon-6-en-1-yl)oxy)-2-phenylacetate

The solution of methyl 2-hydroxy-2-phenylacetate (1.8 g, 11 mmol, 1.3 equiv.) in DMF (50 mL) was added sodium hydride (0.45 g, 60% Wt, 11 mmol, 1.3 equiv.) at 0 °C and continued to stir at rt for 1h, and 9-bromo-3,7-dimethylnon-3-ene (2.0 g, 8.6 mmol, 1.0 equiv.) in DMF (10 mL) was added and stirred at rt for 16 h. The mixture was poured on saturated ammonium chloride (100 mL) and extracted with ethyl acetate. After drying over MgSO₄ and evaporation of the solvent, a clear brown liquid was obtained, which was purified by FC on SiO₂ (heptane/MTBE 10:1) to yield the product as a colourless oil (0.20 g, 7%, mixture of E/Z-isomers).

¹H-NMR (400 MHz, CDCl₃) δ 7.48 - 7.42 (m, 2H), 7.40 - 7.29 (m, 3H), 5.22 - 5.00 (m, 1H), 4.87 (s, 1H), 3.71 (s, 3H), 3.63 - 3.38 (m, 2H), 2.06 - 1.88 (m, 4H), 1.79 - 1.07 (m, 8H), 1.01 - 0.82 (m, 6H) ppm. ¹³C-NMR (101 MHz, CDCl₃) δ 171.5, 171.5, 136.9, 136.8, 136.7, 128.6, 127.1, 127.1, 124.4, 123.2, 81.1, 68.4, 52.2, 37.5, 37.4, 37.2, 37.1, 36.5, 36.5, 32.3, 29.5, 29.5, 25.3, 25.3, 25.0, 25.0, 24.7, 22.9, 19.5, 19.5, 19.5, 15.9, 12.9, 12.8 ppm.

Example 17: 2-((3,7-dimethylnon-6-en-1-yl)oxy)-1,2-diphenylethan-1-one

The procedure described for Example 16 was repeated with 2-hydroxy-1,2-diphenylethan-1-one (2.4 g, 11 mmol, 1.3 equiv.), sodium hydride (0.45 g, 60% Wt, 11 mmol, 1.3 equiv.) and 9-bromo-3,7-dimethylnon-3-ene (2.0 g, 8.6 mmol, 1 equiv.) in DMF (50 mL). After purification of the crude by FC on SiO₂ (heptane/MTBE 20:1) the product was isolated as a colourless oil (0.85 g, 27%, mixture of E/Z-isomers).

¹H-NMR (400 MHz, CDCl₃) δ 8.10 - 7.92 (m, 2H), 7.65 - 7.18 (m, 8H), 5.52 (s, 1H), 5.24 - 4.98 (m, 1H), 3.70 - 3.51 (m, 2H), 2.12 - 1.86 (m, 4H), 1.82 - 1.05 (m, 8H), 1.03 - 0.90 (m, 3H), 0.89 - 0.78 (m, 3H) ppm. ¹³C-NMR (101 MHz, CDCl₃) δ 198.1, 198.0, 136.9, 136.8, 136.7, 136.7, 135.0, 133.1, 129.3, 128.7, 128.6, 128.4, 128.2, 128.1, 127.1, 127.1, 127.1,

124.4, 123.2, 85.8, 68.5, 68.5, 37.4, 37.1, 36.7, 32.4, 29.5, 29.5, 25.3, 25.0, 24.7, 22.9, 19.6, 19.5, 19.5, 15.9, 12.9, 12.8 ppm.

Example 18: 2-((3,7-dimethylnon-6-en-1-yl)oxy)propan-2-yl)benzene

The mixture of 2-phenylpropan-2-ol (1.1 g, 8.1 mmol, 1 equiv.), 3,7-dimethylnon-6-en-1-ol (2.75 g, 16 mmol, 2 equiv.), (hexafluoro-17-stibaneyl)silver (0.28 g, 0.80 mmol, 0.1 equiv.) and platinum(II) chloride (0.086 g, 0.32 mmol, 0.04 equiv.) in dichloromethane (100 mL) was stirred at rt for 4h. The mixture was poured on water (100 mL), and extracted with ethyl acetate. After drying over MgSO₄ and evaporation of the solvent, and the crude oil was purified by FC on SiO₂ (heptane/MTBE 50:1) to yield the product as a colourless oil (1.8 g, 76%, mixture of E/Z-isomers).

¹H-NMR (400 MHz, CDCl₃) δ 7.48 - 7.38 (m, 2H), 7.37 - 7.30 (m, 2H), 7.27 - 7.18 (m, 1H), 5.32 - 4.96 (m, 1H), 3.30 - 3.06 (m, 2H), 2.08 - 1.84 (m, 3H), 1.73 - 0.91 (m, 18H), 0.88 - 0.70 (m, 3H) ppm. ¹³C-NMR (101 MHz, CDCl₃) δ 146.8, 137.8, 136.8, 136.6, 136.3, 136.1, 128.1, 126.7, 125.7, 124.5, 123.3, 118.7, 118.0, 76.3, 61.0, 39.9, 37.6, 37.5, 37.2, 37.0, 36.7, 32.4, 31.6, 29.8, 29.6, 29.6, 28.5, 25.3, 25.3, 25.1, 24.7, 23.4, 22.9, 19.8, 19.7, 19.7, 19.7, 15.9, 15.6, 13.3, 13.2, 12.9, 12.8 ppm.

Example 19: 2-(2-((3,7-dimethylnon-6-en-1-yl)oxy)propan-2-yl)naphthalene

The mixture of 2-(naphthalen-2-yl)propan-2-ol (2, 0 g, 10.7 mmol, 1 equiv.), 3,7-dimethylnon-6-en-1-ol (3.66 g, 21.5 mmol, 2 equiv.), (hexafluoro-17-stibaneyl)silver (0.37 g, 1.1 mmol, 0.1 equiv.) and platinum(II) chloride (0.114 g, 0.43 mmol, 0.04 equiv.) in dichloromethane (100 mL) was stirred at rt for 4h. The mixture was poured on water (100 mL), and extracted with ethyl acetate. After drying over MgSO₄ and evaporation of the solvent, and the crude oil was purified by FC on SiO₂ (heptane/MTBE 50:1) to yield the product as a colourless oil (2.9g, 80%, mixture of E/Z-isomers).

¹H-NMR (400 MHz, CDCl₃) δ 7.74 - 7.66 (m, 4H), 7.56 - 7.48 (m, 1H), 7.38 - 7.31 (m, 2H), 5.01 - 4.91 (m, 1H), 3.15 - 3.04 (m, 2H), 1.95-1.13 (m, 17H), 1.05 - 0.82 (m, 4H), 0.77 - 0.66 (m, 3H) ppm. ¹³C-NMR (101 MHz, CDCl₃) δ 143.2, 135.7, 135.5, 132.1, 131.4, 127.0, 126.8, 126.4, 124.9, 124.6, 123.5, 123.1, 122.2, 75.3, 60.1, 36.5, 36.2, 31.3, 28.5, 28.5, 27.3, 27.3, 24.3, 24.0, 23.7, 21.8, 18.6, 18.6, 14.8, 11.8, 11.8 ppm.

Example 20: Application in liquid detergent

A 40°C machine wash cycle was performed using 55 g of unperfumed liquid detergent prepared with 0.2 % wt/wt of a) 2-((3,7-dimethylnon-6-en-1-yl)oxy)naphthalene (Compound of

Example 6) and b) (E/Z)-3,7-dimethylnon-6-en-1-yl palmitate (Compound of Example 2) and a washload of odour-neutral cotton/elastan mixed fabric T-shirts. The wet and line-dried fabric (1 and 3 days) was assessed by a panel of 9 experts with regard to odour intensity and quality. The odour intensity was recorded on an intensity scale of 0 (odourless) to 5 (extremely strong).
5 As can be seen from the table below, the odour on dry fabric increased from day 1 to day 3. The scent of the dry fabric was floral, fresh and clean.

Compound of example	wet	1 day	3 days
6	0.8	1.6	3.2
2	1.4	2.0	2.7

This illustrates that precursors of the invention release fragrance in a consumer noticeable way.

10 Example 21: Assessment of biodegradability

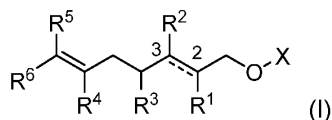
Representative results of the biodegradability assessment of compounds of the present invention by the manometric respirometry test (OECD10 guideline for the testing of materials No. 301F, Paris 1992) are summarized below.

Compound of example	Compound name	Biodegradation in %	result
11	(2E,6Z)-nona-2,6-dien-1-yl 2-hydroxybenzoate	90	readily biodegradable
10	2-((3,7-dimethylnon-6-en-1-yl)oxy)-2-phenylacetaldehyde	63	inherently biodegradable

15 The results show that compounds of the present invention with varying phenol moieties and side chains are biodegradable.
A compound can be classified biodegradable, if it reaches the pass level of 60% oxygen consumption of theory required for complete mineralization.
It is readily biodegradable, if the pass level is reached within 10 days within the 28-day period
20 of the test. The 10-day window begins when the degree of biodegradation has reached 10%.
If the pass level is obtained after 28-day period of the test, the compound can be classified as inherently biodegradable.

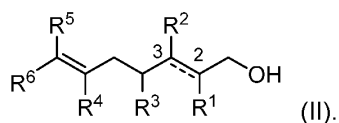
Claims

1. A compound of formula (I)



wherein

- 5 ===== is indicating a carbon-carbon single or double bond between C2 and C3;
 R¹, R³, R⁴, R⁵ and R⁶ is independently selected from the group consisting of H, Me and Et;
 R² is selected from the group consisting of H, Me and Et, or forms together with the carbon atoms C2 and C3 a 3 membered ring; and
 10 X is selected from the group consisting of
 aryl bearing up to two substituents selected from the group consisting of hydroxy, methoxy, ethoxy, formyl, allyl, oxoalkyl, oxoalkenyl and alkyl alkenoate;
 benzyl bearing a substituent selected from the group consisting of hydroxymethyl, formyl, vinyl, (C=O)Me, (C=O)Et, (C=O)OMe, (C=O)OEt, (C=O)Ph at the benzylic position;
 15 propan-2-yl substituted with phenyl, naphthalen-1-yl or naphthalen-2-yl at position 2;
 dimethyl 2-malonate and diethyl 2-malonate; and
 alkanoyl (C(O)-R¹⁰), with R¹⁰ selected from linear or branched C₄ to C₁₈ alkyl, linear or branched C₄ to C₁₈ alkenyl with one or two double bonds, linear or branched C₄ to C₁₈ ether and oxoalkyl, and hydroxyphenyl,
 20 with the proviso that the compound is not nona-2,6-dien-1-yl palmitate
 as precursor for generating a fragrant alcohol of formula (II)



2. The compound of formula (I) according to claim 1, wherein the fragrant alcohol of formula
 25 (II) that is released from the compound of formula (I) is selected from the group consisting of 3,7-dimethylnon-6-en-1-ol, 2,4,7-trimethyloct-6-en-1-ol, 6-nonenol, 6-ethyl-3-methyloct-6-en-1-ol, (1-methyl-2-(5-methylhex-4-en-2-yl)cyclopropyl)methanol, and 2,6-nonadienol.

3. The compound of formula (I) according to claim 1 or 2, wherein X is selected from the group consisting of
aryl bearing up to two substituents selected from the group consisting of hydroxy,
methoxy, ethoxy, formyl, allyl, oxoalkyl, oxoalkenyl and alkyl alkenoate;
5 benzyl bearing a substituent selected from the group consisting of hydroxymethyl, formyl,
vinyl, (C=O)Me, (C=O)Et, (C=O)OMe, (C=O)OEt, (C=O)Ph at the benzylic position;
propan-2-yl substituted with phenyl, naphthalen-1-yl or naphthalen-2-yl at position 2;
dimethyl 2-malonate and diethyl 2-malonate;
and wherein the fragrant alcohol of formula (II) that is released from the compound of
10 formula (I) is selected from the group consisting of 3,7-dimethylnon-6-en-1-ol, 2,4,7-
trimethyloct-6-en-1-ol, 6-nonenol, 6-ethyl-3-methyloct-6-en-1-ol, (1-methyl-2-(5-
methylhex-4-en-2-yl)cyclopropyl)methanol, and 2,6-nonadienol.
4. Use of a compound of formula (I) according to any of claims 1 through 3
15 as precursor for generating a fragrant alcohol of formula (II) according to claim 1.
5. A fragrance composition comprising at least one compound of formula (I) according to
any of claims 1 through 3.
- 20 6. A consumer product comprising at least one compound of formula (I) according any of
claims 1 through 3 and a consumer product base.
7. A method to release a fragrant alcohol of formula (II) as defined in any of claims 1 through
3, wherein a compound of formula (I) as defined in any of claims 1 through 3 is exposed
25 to ambient air and/or humidity.
8. A method of manufacturing a consumer product, comprising the steps of
a) provision of a compound of formula (I) according to any of claims 1 through 3, or a
fragrance composition according to claim 5; and
30 b) admixing it to a consumer product base.
9. Use of a compound of formula (I) according to any of claims 1 through 3 or a fragrance
composition according to claim 5 in consumer products.

10. A method to confer, enhance, improve or modify the hedonic properties of a fragrance composition or a consumer product, which method comprises adding to said composition or consumer product at least one compound of formula (I) according to any of claims 1 through 3.