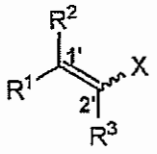
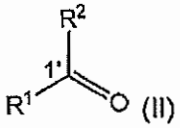
Claims

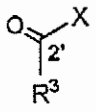
1. The use of a compound of formula (I)


(I)

as precursor for generating a ketone or aldehyde of the formula (II)


(II)

and a carbonyl compound of the formula (III)


(III)

wherein

R^1 is selected from the group consisting of

$C_5 - C_{14}$ alkyl, $C_5 - C_{14}$ alkenyl,

$C_5 - C_6$ cycloalkyl, $C_5 - C_8$ cycloalkyl substituted with 1, 2, or 3 groups selected from $C_1 - C_6$ alkyl and $C_2 - C_4$ alkylidene,

$C_5 - C_8$ cycloalkenyl, $C_5 - C_8$ cycloalkenyl wherein the cycloalkenyl-ring is substituted with 1, 2, or 3 groups selected from $C_1 - C_4$ alkyl, $C_2 - C_4$ alkylidene, and C_3-C_5 cycloalkyl,

$(C_1 - C_3)$alkyl$(C_5 - C_6)$cycloalkyl wherein the cycloalkyl-ring is optionally substituted with one group selected from –OH group and =O group, and/or one or two ether group(s), and/or up to four C_1-C_5 alkyl groups,

$(C_1 - C_4)$alkyl$(C_5 - C_6)$cycloalkenyl wherein the cycloalkenyl-ring is optionally substituted one –OH group, and/or one or two ether group(s), and/or up to four C_1-C_5 alkyl groups,

$(C_2 - C_3)$alkenyl$(C_5 - C_6)$cycloalkenyl wherein the cycloalkenyl-ring is optionally substituted with one –OH group, and/or one or two ether group(s), and/or up to four C_1-C_5 alkyl groups,

$C_6 - C_{14}$ aryl,

$C_6 - C_{14}$ aryl wherein the aryl-ring is substituted with up to 3 groups selected from $C_1 - C_4$ alkyl, $-O-CH_2-O-$, and $-OR^{11}$ wherein R^{11} is independently selected from hydrogen and $C_1 - C_4$ alkyl,

$(C_1 - C_3)$alkyl$(C_6 - C_{14})$aryl,
$(C_1 - C_3)$alkyl$(C_6 - C_{14})$aryl wherein the aryl-ring is substituted with up to 2 groups selected from $C_1 - C_4$ alkyl, $-O-CH_2-O-$, and $-OR^{12}$ wherein R^{12} is independently selected from hydrogen and $C_1 - C_4$ alkyl,

$(C_2 - C_8)$alkenyl$(C_6 - C_{14})$aryl,
$(C_2 - C_8)$alkenyl$(C_6 - C_{14})$aryl wherein the aryl-ring is substituted with up to 2 groups selected from $C_1 - C_4$ alkyl, $-O-CH_2-O-$, and $-OR^{13}$ wherein R^{13} is independently selected from hydrogen and $C_1 - C_4$ alkyl, and

bi-, tri, or tetracyclic hydrocarbon ring comprising $C_8 - C_{12}$ carbon atoms optionally substituted with up to 6 groups selected from $C_1 - C_4$ alkyl, $-O-CH_2-O-$, and $-OR^{14}$ wherein R^{14} is independently selected from hydrogen and $C_1 - C_4$ alkyl;

R^2 is selected from hydrogen, $C_1 - C_5$ alkyl, and $C_2 - C_5$ alkenyl;

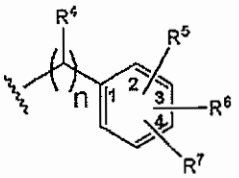
or

R^1 and R^2 form together with the carbon atom to which they are attached

a) a 5 to 7 membered hydrocarbon ring(s), the ring(s) may contain up to two ether groups, and /or the ring(s) may optionally be substituted with C_1-C_5 alkyl groups
b) 2-(2-(4-methylcyclohex-3-en-1-yl)propyl)cyclopent-1-ylidene, or
c) a 14 – 17 membered hydrocarbon ring, the ring may be substituted with a methyl group;

R^3 is hydrogen or methyl; and

X means a radical of formula (Ia)



(Ia)

wherein n is 0 or 1;
R^4 is hydrogen or methyl;

R^5 is hydrogen or methyl;

R^6 is selected from hydrogen, $C_1 - C_5$ alkyl, vinyl, hydroxyl, methoxy or ethoxy; and

R^7 is selected from hydrogen, $C_1 - C_5$ alkyl, vinyl, hydroxyl, methoxy or ethoxy;

with the proviso that if one of R^6 and R^7 is hydroxyl then the other is selected from methoxy or ethoxy;

or

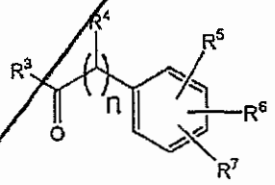
R^6 and R^7 form together with the carbon atoms to which they are attached a 5 or 6 membered ring containing up to two oxygen atoms, wherein the ring may optionally be substituted with up to 6 methyl groups;

with the proviso that

a) if n = 0, R^1 is not a group selected from aryl and aryl substituted with an $-OR^{11}$ wherein R^{11} is C_1-C_4 alkyl; and

b) if R^3 is hydrogen and R^1 is selected from the group consisting of alkenyl, alkenylcycloalkenyl, alkenylaryl and cycloalkenyl in which no sp^3-hybridised C-atom is between C-1' and the nearest C-C double bond of R^1, then n = 1.

2. A method of generating a carbonyl compound of the formula



wherein n is 0 or 1;

R^3 is hydrogen or methyl;

R^4 is hydrogen or methyl;

R^5 is hydrogen or methyl;

R^6 is selected from hydrogen, $C_1 - C_5$ alkyl, vinyl, hydroxyl, methoxy or ethoxy; and

R^7 is selected from hydrogen, $C_1 - C_5$ alkyl, vinyl, hydroxyl, methoxy or ethoxy;

with the proviso that if one of R^6 and R^7 is hydroxyl then the other is selected from methoxy or ethoxy (e.g. if R^6 = OH, then R^7 = methoxy or ethoxy);

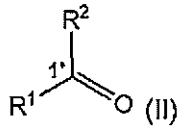
or

R^6 and R^7 form together with the carbon atoms to which they are attached a 5 or 6 membered ring containing up to two oxygen atoms, wherein the ring may optionally be substituted with up to 6 methyl groups

characterized in that a compound of formula (I) as defined by claim 1 is exposed to oxygen.

3. A method according to claim 2 wherein the carbonyl compound is selected from ethylvanilin, vanillin, 1-(naphthalen-2-yl)ethanone, acetophenone, 1,3-benzodioxole-5-carboxaldehyde, anisic aldehyde, veratric aldehyde, phenylacetic aldehyde, 4-methyl phenylacetaldehyde, benzaldehyde, 3-methyl-benzaldehyde, 1-(4-methoxyphenyl)ethanone, 4-(1-methylethyl)-benzenacetaldehyde, 2,4-(di-(1,1-dimethylethyl))-5-methoxy-benzaldehyde, 4-isopropyl-benzaldehyde, 1-(2,4-dimethylphenyl)ethanone, 5,5,7,8,8-pentamethyl-5,6,7,8-tetrahydronaphthalene-2-carbaldehyde, 1-(3,5,5,6,8,8-hexamethyl-5,6,7,8-tetrahydronaphthalen-2-yl)ethanone, 1-(5,6,7,8-tetrahydronaphthalen-2-yl)ethanone, 1-(1,1,2,3,3,6-hexamethyl-2,3-dihydro-1H-inden-5-yl)ethanone, 2-(4-isopropylphenyl)propanal, 3,5,5,6,7,8,8-heptamethyl-5,6,7,8-tetrahydronaphthalene-2-carbaldehyde, 2,3,3-trimethyl-2,3-dihydro-1H-inden-1-one, and mixtures thereof.

4. A method of generating a fragrant aldehyde or ketone of the formula (II)



(II)

wherein

R^1 is selected from the group consisting of

$C_5 - C_{14}$ alkyl, $C_5 - C_{14}$ alkenyl,

$C_5 - C_6$ cycloalkyl, $C_5 - C_8$ cycloalkyl substituted with 1, 2, or 3 groups selected from $C_1 - C_6$ alkyl and $C_2 - C_4$ alkylidene,

$C_5 - C_8$ cycloalkenyl, C_5- C_8 cycloalkenyl wherein the cycloalkenyl-ring is substituted with 1, 2, or 3 groups selected from $C_1 - C_4$ alkyl, $C_2 - C_4$ alkylidene and C_3-C_5 cycloalkyl,

$(C_1 - C_3)$alkyl$(C_5 - C_6)$cycloalkyl wherein the cycloalkyl-ring is optionally substituted with one group selected from –OH group and =O group, and/or one or two ether group(s), and/or up to four C_1-C_5 alkyl groups,

$(C_1 - C_4)$alkyl$(C_5 - C_6)$cycloalkenyl wherein the cycloalkenyl-ring is optionally substituted with one –OH group, and/or one or two ether group(s), and/or up to four C_1-C_5 alkyl groups,

$(C_2 - C_3)$alkenyl$(C_5 - C_6)$cycloalkenyl wherein the cycloalkenyl-ring is optionally substituted with one –OH group, and/or one or two ether group(s), and/or up to four C_1-C_5 alkyl groups,

$C_6 - C_{14}$ aryl,
$C_6 - C_{14}$ aryl wherein the aryl-ring is substituted with up to 3 groups selected from $C_1 - C_4$ alkyl, $-O-CH_2-O-$, and $-OR^{11}$ wherein R^{11} is independently selected from hydrogen and $C_1 - C_4$ alkyl,

$(C_1 - C_3)$alkyl$(C_6 - C_{14})$aryl,
$(C_1 - C_3)$alkyl$(C_6 - C_{14})$aryl wherein the aryl-ring is substituted with up to 2 groups selected from $C_1 - C_4$ alkyl, $-O-CH_2-O-$, and $-OR^{12}$ wherein R^{12} is independently selected from hydrogen and $C_1 - C_4$ alkyl,

$(C_2 - C_8)$alkenyl$(C_6 - C_{14})$aryl,
$(C_2 - C_8)$alkenyl$(C_6 - C_{14})$aryl wherein the aryl ring is substituted with up to 2 groups selected from $C_1 - C_4$ alkyl, $-O-CH_2-O-$, and $-OR^{13}$ wherein R^{13} is independently selected from hydrogen and $C_1 - C_4$ alkyl, and

bi-, tri, or tetracyclic hydrocarbon ring comprising $C_8 - C_{12}$ carbon atoms optionally substituted with up to 6 groups selected from $C_1 - C_4$ alkyl, $-O-CH_2-O-$, and $-OR^{14}$ wherein R^{14} is independently selected from hydrogen and $C_1 - C_4$ alkyl;

R^2 is selected from hydrogen, $C_1 - C_5$ alkyl, and $C_2 - C_5$ alkenyl,

or

R^1 and R^2 form together with the carbon atom to which they are attached
a) a 5 to 7 membered hydrocarbon ring(s), the ring(s) may contain up to two ether groups, and/or the ring(s) may optionally be substituted with C_1-C_5 alkyl groups
b) 2-(2-(4-methylcyclohex-3-en-1-yl)propyl)cyclopent-1-ylidene, or

c) a 14 – 17 membered hydrocarbon ring, the ring may be substituted with a methyl group; and

R^3 is hydrogen or methyl;

characterized in that a compound of formula (I) as defined by claim 1 is exposed to oxygen.

5. A method according to claim 4 wherein the generated fragrant aldehyde is selected form benzaldehyde, 2,6,10-trimethylundec-9-enal, 8,8-dimethyl-1,2,3,4,5,6,7,8-octahydro-naphthalene-2-carbaldehyde, (4-isopropyl-phenyl)-ethanal, 2,4-dimethyl-cyclohex-3-ene-1-carbaldehyde, 1,3,5-trimethyl-cyclohex-1-ene-4-carbaldehyde, 4-(4-hydroxy-4-methylpentyl)-cyclohex-3-ene-1-carbaldehyde, hex-2-enal, hex-3-enal, 3-(3-tert-butylcyclohexyl)propanal, 2-(4-tert-pentylcyclohexyl)acetaldehyde, 3,5,5-trimethyl-hexanal, heptanal, 2,6-dimethyl-hept-5-enal, decanal, dec-8-enal, dec-4-en-1-al, 2-methyl-decanal, undec-10-en-1-al, undecanal, dodecanal, 2-methyl-undecanal, tridecanal, tridec-2-enal, octanal, nonanal, non-2-enal, undec-9-enal, 2-phenyl-propanal, 2-(4-methyl-phenyl)-ethanal, 2-(4-methoxyphenyl)acetaldehyde, 3,7-dimethyl-octanal, 3,7,11-trimethyldodeca-6,10-dienal, 7-hydroxy-3,7-dimethyl-octanal, 2,6-dimethyl-oct-5-en-1-al, 3-(3-isopropyl-phenyl)-butanal, 4-(4-methyl-pent-3-enyl)-cyclohex-3-ene-1-carbaldehyde, 2,3,5,5,-tetramethyl-hexanal, decahydro-4,8,8-trimethyl-1,4-methanoazulene-9-carboxaldehyde, 2-methyl-3-(4-tert-butylphenyl)-propanal, 3-(4-tert-butyl-phenyl)-propanal, 3-(4-isobutyl-phenyl)-propanal, 3-(benzo[1,3]dioxol-5-yl)-2-methyl-propanal, 3,7-dimethyl-oct-6-ene-1-al, 3,7-dimethyl-octanal, 2-methyl-3-(4-isopropylphenyl)-propanal, 4-tert-butyl-cyclohexane-1-carbaldehyde, 4-(octahydro-4,7-methano-5H-inden-5-ylidene)-butanal, (3,7-dimethyl-oct-6-enyloxy)-ethanal, 2 (E),6 (Z)-nonadienal, 2,4-dimethyl-2,6-heptadienal, (E)-dec-2-enal, dodec-2-enal, 3,7-dimethyl-octa-2,6-dienal, 2,4-diethyl-hepta-2,6-dienal, 3,7-dimethyl-nona-2,6-dienal, 2-propyl-hept-2-enal, 3-(4-methoxyphenyl)-2-methylpropanal, 4-methoxybenzaldehyde, 1,3-benzodioxole-5-carboxaldehyde, 2,6,6-trimethylcyclohexa-1,3-dienecarbaldehyde, 4-((6-methylheptan-2-yl)oxy)butanal, 3-(4-ethylphenyl)-2,2-dimethylpropanal, (E)-2-benzylideneheptanal, cinnamaldehyde, 3-(3,3-dimethyl-2,3-dihydro-1H-inden-5-yl)propanal, 2-methyl-4-(2,6,6-trimethylcyclohex-2-en-1-yl)butanal, 4-isopropenyl-cyclohex-1-ene-1-carbaldehyde, and mixtures thereof.

6. A method according to claim 4 wherein the generated fragrant ketone is selected from 4-(4-hydroxyphenyl)butan-2-one, alpha-lonone, dihydro alpha-lonone, dihydro beta-lonone, 1-(2,6,6-trimethyl-2-cyclohexen-1-yl)-1,6-heptadien-3-one, beta-lonone, 1-(2,6,6-trimethylcyclohex-2-en-1-yl)pent-1-en-3-one, 2-methyl-1-(2,6,6-trimethylcyclohex-2-en-1-yl)pent-1-en-3-one, 3-methyl-4-(2,6,6-trimethylcyclohex-2-en-1-yl)but-3-en-2-one, 2-(2-(4-methylcyclohex-3-en-1-yl)propyl)cyclopentanone, 3-(2-oxopropyl)-2-pentylcyclopentanone, acetophenone, 1-(naphthalen-2-yl)ethanone, 4-(benzo[d][1,3]dioxol-5-yl)butan-2-one, and mixtures thereof.

7. A compound of formula (I) as defined in claim 1 selected from the list of (3-methyl-5-(2,6,6-trimethylcyclohex-1-enyl)pent-2-enyl)benzene; (5,9-dimethyldec-2-enyl)benzene; (4-methyltridec-2-enyl)benzene; (3-(2,4-dimethylcyclohex-3-enyl)allyl)benzene; (4-methyldodec-2-enyl)benzene; 1-isopropyl-3-(6-phenylhex-4-en-2-yl)benzene; but-2-ene-1,3-diyldibenzene; ((4*E*)-3-methyl-5-(2,6,6-trimethylcyclohex-1-enyl)penta-2,4-dienyl)benzene; (3-methyldodec-2-enyl)benzene; 5-(3-methyl-5-phenylpent-3-enyl)benzo[*d*][1,3]dioxole; ((4*E*)-3,4-dimethyl-5-(2,6,6-trimethylcyclohex-2-enyl)penta-2,4-dienyl)benzene; (4*E*,8*Z*)-undeca-2,4,8-trienylbenzene; (6*E*)-dodeca-2,6-dienylbenzene; 1-*tert*-butyl-4-(2-methyl-5-phenylpent-3-enyl)benzene; 1-(2,2-dimethyl-5-phenylpent-3-enyl)-4-ethylbenzene; (5,7,7-trimethyloct-2-enyl)benzene; (6-(6-methylheptan-2-yloxy)hex-2-enyl)benzene; (5-(3-*tert*-utylcyclohexyl)pent-2-enyl)benzene; (4-(4-*tert*-pentylcyclohexyl)but-2-enyl)benzene; 2-ethoxy-4-(3-phenylprop-1-enyl)phenol; 4-(3-methyl-5-phenylpent-3-enyl)phenol; 2-ethoxy-4-(3-p-tolylprop-1-enyl)phenol; 2-ethoxy-4-(3-(4-methoxyphenyl)prop-1-enyl)phenol; 1-methoxy-4-(4-methyltridec-2-enyl)benzene; 1-isopropyl-3-(6-(4-methoxyphenyl)hex-4-en-2-yl)benzene; 1-((6*E*)-dodeca-2,6-dienyl)-4-methoxybenzene; 2-(4-(4-methoxyphenyl)but-2-en-2-yl)naphthalene; 1-*tert*-butyl-4-(5-(4-methoxyphenyl)-2-methylpent-3-enyl)benzene; 1-methyl-4-(4-methyltridec-2-enyl)benzene; 1-((6*E*)-dodeca-2,6-dienyl)-4-methylbenzene; 1-*tert*-butyl-4-(2-methyl-5-*p*-tolylpent-3-enyl)benzene; 1-methyl-4-((4E)-3-methyl-5-(2,6,6-trimethylcyclohex-1-en-1-yl)penta-2,4-dien-1-yl)benzene; 5-(3-*p*-tolylprop-1-enyl)benzo[*d*][1,3]dioxole; 2-(4-methyltridec-2-enyl)naphthalene; 4-(3-methyl-4-phenylbut-3-enyl)phenol; 2-ethoxy-4-(4-(4-hydroxyphenyl)-2-methylbut-1-enyl)phenol; 2-ethoxy-4-(4-(3-isopropylphenyl)pent-1-enyl)phenol; 2-ethoxy-4-(3-methyldodec-1-enyl)phenol; 2-ethoxy-4-((2-(2-(4-methylcyclohex-3-enyl)propyl)cyclopentylidene)methyl)-phenol; 2-(5-(3-isopropylphenyl)hex-2-en-2-yl)naphthalene; 2-((4*E*,8*Z*)-undeca-2,4,8-trien-2-

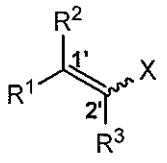
yl)naphthalene; 2-((6*E*)-dodeca-2,6-dien-2-yl)naphthalene; 2-(4-methyltridec-2-en-2-yl)naphthalene; 2-(5,7,7-trimethyloct-2-en-2-yl)naphthalene; 4-(4-(3-isopropylphenyl)pent-1-enyl)-1,2-dimethoxybenzene; 1,2-dimethoxy-4-(4-(4-methoxyphenyl)-3-methylbut-1-enyl)benzene; 5-(4-(3-isopropylphenyl)pent-1-enyl)benzo[*d*][1,3]dioxole; 5-(4-(4-methoxyphenyl)-3-methylbut-1-enyl)benzo[*d*][1,3]dioxole; 5-(4-(4-*tert*-butylphenyl)-3-methylbut-1-enyl)benzo[*d*][1,3]dioxole; 1-methoxy-4-(3-(p-tolyl)prop-1-en-1-yl)benzene; 1-(tert-butyl)-4-(4-(4-methoxyphenyl)-2-methylbut-3-en-1-yl)benzene; 4-(4-(4-methoxyphenyl)-3-methylbut-3-en-1-yl)phenol; 1-isopropyl-3-(5-(4-methoxyphenyl)pent-4-en-2-yl)benzene; 1-isobutyl-4-(4-(4-methoxyphenyl)but-3-en-1-yl)benzene; 2-((11E)-trideca-2,11-dien-2-yl)naphthalene; 5-(4-phenylbut-1-en-1-yl)benzo[d][1,3]dioxole; 1,2-dimethoxy-4-(3-(4-(prop-1-en-2-yl)cyclohex-1-en-1-yl)allyl)benzene; 2-(5-(4-(tert-butyl)phenyl)-4-methylpent-2-en-2-yl)naphthalene; 2-((4E)-5,9-dimethyldeca-2,4,8-trien-2-yl)naphthalene; 2-(5-phenylpent-2-en-2-yl)naphthalene; 2-((4E)-tetradeca-2,4-dien-2-yl)naphthalene; 3-(3-(4-methoxyphenyl)-2-methylallyl)-2-pentylcyclopentanone; 1-methoxy-4-[(5E)-undeca-1,5-dien-1-yl]benzene; 1-methoxy-4-(3-methyldodec-1-en-1-yl)benzene; (1E)-1-[(4Z)-hepta-1,4-dien-1-yl]-4-methoxybenzene; (1Z)-1-[(4Z)-hepta-1,4-dien-1-yl]-4-methoxybenzene; and 4-[3-methyl-4-(m-tolyl)but-3-en-1-yl]phenol.

8. A consumer product comprising a compound of formula (I) as defined by claim 1 and a product base.

9. A product according to claim 8 wherein the consumer product is selected from home care products, personal care products and cleaning products.

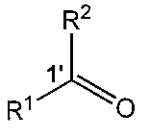
Claims

1. The use of a compound of formula (I)



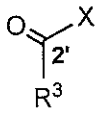
(I)

as precursor for generating in the presence of molecular oxygen a ketone or aldehyde of the formula (II)



(II)

and a carbonyl compound of the formula (III)



(III)

wherein

R^1 is selected from the group consisting of

C_5 – C_{14} alkyl comprising up to one –OH group and up to 2 ether group(s), C_5 – C_{14} alkenyl optionally comprising a –OH group and/or ether group,

C_5 – C_6 cycloalkyl, C_5 – C_8 cycloalkyl substituted with 1, 2, or 3 groups selected from C_1 – C_6 alkyl and C_2 – C_4 alkylidene,

C_5 – C_8 cycloalkenyl, C_5- C_8 cycloalkenyl wherein the cycloalkenyl-ring is substituted with 1, 2, or 3 groups selected from C_1 – C_4 alkyl, C_2 – C_4 alkylidene, and C_3-C_5 cycloalkyl,

(C_1 – C_3)alkyl(C_5 – C_6)cycloalkyl wherein the cycloalkyl-ring is optionally substituted with one group selected from –OH group and =O group, and/or one or two ether group(s), and/or up to four C_1-C_5 alkyl groups,

(C_1 – C_4)alkyl(C_5 – C_6)cycloalkenyl wherein the cycloalkenyl-ring is optionally substituted one –OH group, and/or one or two ether group(s), and/or up to four C_1-C_5 alkyl groups,

(C_2 – C_3)alkenyl(C_5 – C_6)cycloalkenyl wherein the cycloalkenyl-ring is optionally substituted with one –OH group, and/or one or two ether group(s), and/or up to four C_1-C_5 alkyl groups,

$C_6 - C_{14}$ aryl,

$C_6 - C_{14}$ aryl wherein the aryl-ring is substituted with up to 3 groups selected from $C_1 - C_4$ alkyl, $- O - CH_2 - O -$, and $-OR^{11}$ wherein R^{11} is independently selected from hydrogen and $C_1 - C_4$ alkyl,

$(C_1 - C_3)$alkyl$(C_6 - C_{14})$aryl,
$(C_1 - C_3)$alkyl$(C_6 - C_{14})$aryl wherein the aryl-ring is substituted with up to 2 groups selected from $C_1 - C_4$ alkyl, $- O - CH_2 - O -$, and $-OR^{12}$ wherein R^{12} is independently selected from hydrogen and $C_1 - C_4$ alkyl,

$(C_2 - C_8)$alkenyl$(C_6 - C_{14})$aryl,
$(C_2 - C_8)$alkenyl$(C_6 - C_{14})$aryl wherein the aryl-ring is substituted with up to 2 groups selected from $C_1 - C_4$ alkyl, $- O - CH_2 - O -$, and $-OR^{13}$ wherein R^{13} is independently selected from hydrogen and $C_1 - C_4$ alkyl, and

bi-, tri, or tetracyclic hydrocarbon ring comprising $C_8 - C_{12}$ carbon atoms optionally substituted with up to 6 groups selected from $C_1 - C_4$ alkyl, $- O - CH_2 - O -$, and $-OR^{14}$ wherein R^{14} is independently selected from hydrogen and $C_1 - C_4$ alkyl;

R^2 is selected from hydrogen, $C_1 - C_5$ alkyl, and $C_2 - C_5$ alkenyl;

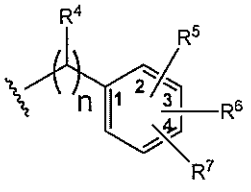
or

R^1 and R^2 form together with the carbon atom to which they are attached

a) a 5 to 7 membered hydrocarbon ring(s), the ring(s) may contain up to two ether groups, and /or the ring(s) may optionally be substituted with C_1-C_5 alkyl groups
b) 2-(2-(4-methylcyclohex-3-en-1-yl)propyl)cyclopent-1-ylidene, or
c) a 14 – 17 membered hydrocarbon ring, the ring may be substituted with a methyl group;

R^3 is hydrogen or methyl; and

X means a radical of formula (Ia)



(Ia)

wherein n is 0 or 1;

R^4 is hydrogen or methyl;

R^5 is hydrogen or methyl;

R^6 is selected from hydrogen, $C_1 - C_5$ alkyl, vinyl, hydroxyl, methoxy or ethoxy; and

R^7 is selected from hydrogen, $C_1 - C_5$ alkyl, vinyl, hydroxyl, methoxy or ethoxy; with the proviso that if one of R^6 and R^7 is hydroxyl then the other is selected from methoxy or ethoxy;

or

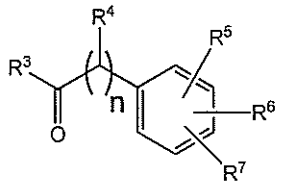
R^6 and R^7 form together with the carbon atoms to which they are attached a 5 or 6 membered ring containing up to two oxygen atoms, wherein the ring may optionally be substituted with up to 6 methyl groups;

with the proviso that

a) if n = 0, R^1 is not a group selected from aryl and aryl substituted with an $-OR^{11}$ wherein R^{11} is hydrogen or C_1-C_4 alkyl; and

b) if R^3 is hydrogen and R^1 is selected from the group consisting of alkenyl, alkenylcycloalkenyl, alkenylaryl and cycloalkenyl in which no sp^3-hybridised C-atom is between C-1' and the nearest C-C double bond of R^1, then n = 1.

2. A method of generating a carbonyl compound of the formula



wherein n is 0 or 1;

R^3 is hydrogen or methyl;

R^4 is hydrogen or methyl;

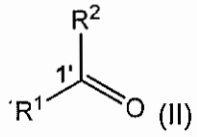
R^5 is hydrogen or methyl;

R^6 is selected from hydrogen, $C_1 - C_5$ alkyl, vinyl, hydroxyl, methoxy or ethoxy; and
R^7 is selected from hydrogen, $C_1 - C_5$ alkyl, vinyl, hydroxyl, methoxy or ethoxy;
with the proviso that if one of R^6 and R^7 is hydroxyl then the other is selected from methoxy or ethoxy (e.g. if R^6 = OH, then R^7 = methoxy or ethoxy);
or
R^6 and R^7 form together with the carbon atoms to which they are attached a 5 or 6 membered ring containing up to two oxygen atoms, wherein the ring may optionally be substituted with up to 6 methyl groups

characterized in that a compound of formula (I) as defined by claim 1 is exposed to molecular oxygen.

3. A method according to claim 2 wherein the carbonyl compound is selected from ethylvanilin, vanillin, 1-(naphthalen-2-yl)ethanone, acetophenone, 1,3-benzodioxole-5-carboxaldehyde, anisic aldehyde, veratric aldehyde, phenylacetic aldehyde, 4-methyl phenylacetaldehyde, benzaldehyde, 3-methyl-benzaldehyde, 1-(4-methoxyphenyl)ethanone, 4-(1-methylethyl)-benzenacetaldehyde, 2,4-(di-(1,1-dimethylethyl))-5-methoxy-benzaldehyde, 4-isopropyl-benzaldehyde, 1-(2,4-dimethylphenyl)ethanone, 5,5,7,8,8-pentamethyl-5,6,7,8-tetrahydronaphthalene-2-carbaldehyde, 1-(3,5,5,6,8,8-hexamethyl-5,6,7,8-tetrahydronaphthalen-2-yl)ethanone, 1-(5,6,7,8-tetrahydronaphthalen-2-yl)ethanone, 1-(1,1,2,3,3,6-hexamethyl-2,3-dihydro-1H-inden-5-yl)ethanone, 2-(4-isopropylphenyl)propanal, 3,5,5,6,7,8,8-heptamethyl-5,6,7,8-tetrahydronaphthalene-2-carbaldehyde, 2,3,3-trimethyl-2,3-dihydro-1H-inden-1-one, and mixtures thereof.

4. A method of generating a fragrant aldehyde or ketone of the formula (II)



(II)

wherein
R^1 is selected from the group consisting of
$C_5 - C_{14}$ alkyl comprising up to one –OH group and up to 2 ether group(s), $C_5 - C_{14}$ alkenyl optionally comprising a –OH group and/or ether group,

$C_5 – C_6$ cycloalkyl, $C_5 – C_8$ cycloalkyl substituted with 1, 2, or 3 groups selected from $C_1 – C_6$ alkyl and $C_2 – C_4$ alkylidene,

$C_5 – C_8$ cycloalkenyl, C_5- C_8 cycloalkenyl wherein the cycloalkenyl-ring is substituted with 1, 2, or 3 groups selected from $C_1 – C_4$ alkyl, $C_2 – C_4$ alkylidene and C_3-C_5 cycloalkyl,

$(C_1 – C_3)$alkyl$(C_5 – C_6)$cycloalkyl wherein the cycloalkyl-ring is optionally substituted with one group selected from –OH group and =O group, and/or one or two ether group(s), and/or up to four C_1-C_5 alkyl groups,

$(C_1 – C_4)$alkyl$(C_5 – C_6)$cycloalkenyl wherein the cycloalkenyl-ring is optionally substituted with one –OH group, and/or one or two ether group(s), and/or up to four C_1-C_5 alkyl groups,

$(C_2 – C_3)$alkenyl$(C_5 – C_6)$cycloalkenyl wherein the cycloalkenyl-ring is optionally substituted with one –OH group, and/or one or two ether group(s), and/or up to four C_1-C_5 alkyl groups,

$C_6 – C_{14}$ aryl,
$C_6 – C_{14}$ aryl wherein the aryl-ring is substituted with up to 3 groups selected from $C_1 – C_4$ alkyl, $– O – CH_2 – O –$, and $–OR^{11}$ wherein R^{11} is independently selected from hydrogen and $C_1 – C_4$ alkyl,

$(C_1 – C_3)$alkyl$(C_6 – C_{14})$aryl,
$(C_1 – C_3)$alkyl$(C_6 – C_{14})$aryl wherein the aryl-ring is substituted with up to 2 groups selected from $C_1 – C_4$ alkyl, $– O – CH_2 – O –$, and $–OR^{12}$ wherein R^{12} is independently selected from hydrogen and $C_1 – C_4$ alkyl,

$(C_2 – C_8)$alkenyl$(C_6 – C_{14})$aryl,
$(C_2 – C_8)$alkenyl$(C_6 – C_{14})$aryl wherein the aryl ring is substituted with up to 2 groups selected from $C_1 – C_4$ alkyl, $– O – CH_2 – O –$, and $–OR^{13}$ wherein R^{13} is independently selected from hydrogen and $C_1 – C_4$ alkyl, and

bi-, tri, or tetracyclic hydrocarbon ring comprising $C_8 – C_{12}$ carbon atoms optionally substituted with up to 6 groups selected from $C_1 – C_4$ alkyl, $– O – CH_2 – O –$, and $–OR^{14}$ wherein R^{14} is independently selected from hydrogen and $C_1 – C_4$ alkyl;

R^2 is selected from hydrogen, $C_1 – C_5$ alkyl, and $C_2 – C_5$ alkenyl,

or

R^1 and R^2 form together with the carbon atom to which they are attached

a) a 5 to 7 membered hydrocarbon ring(s), the ring(s) may contain up to two ether groups, and/or the ring(s) may optionally be substituted with C_1-C_5 alkyl groups

b) 2-(2-(4-methylcyclohex-3-en-1-yl)propyl)cyclopent-1-ylidene, or

c) a 14 – 17 membered hydrocarbon ring, the ring may be substituted with a methyl group; and

R^3 is hydrogen or methyl;

characterized in that a compound of formula (I) as defined by claim 1 is exposed to molecular oxygen.

5. A method according to claim 4 wherein the generated fragrant aldehyde is selected form benzaldehyde, 2,6,10-trimethylundec-9-enal, 8,8-dimethyl-1,2,3,4,5,6,7,8-octahydro-naphthalene-2-carbaldehyde, (4-isopropyl-phenyl)-ethanal, 2,4-dimethyl-cyclohex-3-ene-1-carbaldehyde, 1,3,5-trimethyl-cyclohex-1-ene-4-carbaldehyde, 4-(4-hydroxy-4-methylpentyl)-cyclohex-3-ene-1-carbaldehyde, hex-2-enal, hex-3-enal, 3-(3-tert-butylcyclohexyl)propanal, 2-(4-tert-pentylcyclohexyl)acetaldehyde, 3,5,5-trimethyl-hexanal, heptanal, 2,6-dimethyl-hept-5-enal, decanal, dec-9-enal, dec-4-en-1-al, 2-methyl-decanal, undec-10-en-1-al, undecanal, dodecanal, 2-methyl-undecanal, tridecanal, tridec-2-enal, octanal, nonanal, non-2-enal, undec-9-enal, 2-phenyl-propanal, 2-(4-methyl-phenyl)-ethanal, 2-(4-methoxyphenyl)acetaldehyde, 3,7-dimethyl-octanal, 3,7,11-trimethyldodeca-6,10-dienal, 7-hydroxy-3,7-dimethyl-octanal, 2,6-dimethyl-oct-5-en-1-al, 3-(3-isopropyl-phenyl)-butanal, 4-(4-methyl-pent-3-enyl)-cyclohex-3-ene-1-carbaldehyde, 2,3,5,5,-tetramethyl-hexanal, decahydro-4,8,8-trimethyl-1,4-methanoazulene-9-carboxaldehyde, 2-methyl-3-(4-tert-butylphenyl)-propanal, 3-(4-tert-butyl-phenyl)-propanal, 3-(4-isobutyl-phenyl)-propanal, 3-(benzo[1,3]dioxol-5-yl)-2-methyl-propanal, 3,7-dimethyl-oct-6-ene-1-al, 3,7-dimethyl-octanal, 2-methyl-3-(4-isopropylphenyl)-propanal, 4-tert-butyl-cyclohexane-1-carbaldehyde, 4-(octahydro-4,7-methano-5H-inden-5-ylidene)-butanal, (3,7-dimethyl-oct-6-enyloxy)-ethanal, 2 (E),6 (Z)-nonadienal, 2,4-dimethyl-2,6-heptadienal, (E)-dec-2-enal, dodec-2-enal, 3,7-dimethyl-octa-2,6-dienal, 2,4-diethyl-hepta-2,6-dienal, 3,7-dimethyl-nona-2,6-dienal, 2-propyl-hept-2-enal, 3-(4-methoxyphenyl)-2-methylpropanal, 4-

methoxybenzaldehyde, 1,3-benzodioxole-5-carboxaldehyde, 2,6,6-trimethylcyclohexa-1,3-dienecarbaldehyde, 4-((6-methylheptan-2-yl)oxy)butanal, 3-(4-ethylphenyl)-2,2-dimethylpropanal, (E)-2-benzylideneheptanal, cinnamaldehyde, 3-(3,3-dimethyl-2,3-dihydro-1H-inden-5-yl)propanal, 2-methyl-4-(2,6,6-trimethylcyclohex-2-en-1-yl)butanal, 4-isopropenyl-cyclohex-1-ene-1-carbaldehyde, and mixtures thereof.

6. A method according to claim 4 wherein the generated fragrant ketone is selected from 4-(4-hydroxyphenyl)butan-2-one, alpha-Ionone, dihydro alpha-Ionone, dihydro beta-Ionone, 1-(2,6,6-trimethyl-2-cyclohexen-1-yl)-1,6-heptadien-3-one, beta-Ionone, 1-(2,6,6-trimethylcyclohex-2-en-1-yl)pent-1-en-3-one, 2-methyl-1-(2,6,6-trimethylcyclohex-2-en-1-yl)pent-1-en-3-one, 3-methyl-4-(2,6,6-trimethylcyclohex-2-en-1-yl)but-3-en-2-one, 2-(2-(4-methylcyclohex-3-en-1-yl)propyl)cyclopentanone, 3-(2-oxopropyl)-2-pentylcyclopentanone, acetophenone, 1-(naphthalen-2-yl)ethanone, 4-(benzo[d][1,3]dioxol-5-yl)butan-2-one, and mixtures thereof.

7. A compound of formula (I) as defined in claim 1 selected from the list of (3-methyl-5-(2,6,6-trimethylcyclohex-1-enyl)pent-2-enyl)benzene; (5,9-dimethyldec-2-enyl)benzene; (4-methyltridec-2-enyl)benzene; (3-(2,4-dimethylcyclohex-3-enyl)allyl)benzene; (4-methyldodec-2-enyl)benzene; 1-isopropyl-3-(6-phenylhex-4-en-2-yl)benzene; ((4*E*)-3-methyl-5-(2,6,6-trimethylcyclohex-1-enyl)penta-2,4-dienyl)benzene; (3-methyldodec-2-enyl)benzene; 5-(3-methyl-5-phenylpent-3-enyl)benzo[*d*][1,3]dioxole; ((4*E*)-3,4-dimethyl-5-(2,6,6-trimethylcyclohex-2-enyl)penta-2,4-dienyl)benzene; (4*E*,8*Z*)-undeca-2,4,8-trienylbenzene; (6*E*)-dodeca-2,6-dienylbenzene; 1-*tert*-butyl-4-(2-methyl-5-phenylpent-3-enyl)benzene; 1-(2,2-dimethyl-5-phenylpent-3-enyl)-4-ethylbenzene; (5,7,7-trimethyloct-2-enyl)benzene; (6-(6-methylheptan-2-yloxy)hex-2-enyl)benzene; (5-(3-*tert*-utylcyclohexyl)pent-2-enyl)benzene; (4-(4-*tert*-pentylcyclohexyl)but-2-enyl)benzene; 2-ethoxy-4-(3-phenylprop-1-enyl)phenol; 4-(3-methyl-5-phenylpent-3-enyl)phenol; 2-ethoxy-4-(3-p-tolylprop-1-enyl)phenol; 2-ethoxy-4-(3-(4-methoxyphenyl)prop-1-enyl)phenol; 1-methoxy-4-(4-methyltridec-2-enyl)benzene; 1-isopropyl-3-(6-(4-methoxyphenyl)hex-4-en-2-yl)benzene; 1-((6*E*)-dodeca-2,6-dienyl)-4-methoxybenzene; 2-(4-(4-methoxyphenyl)but-2-en-2-yl)naphthalene; 1-*tert*-butyl-4-(5-(4-methoxyphenyl)-2-methylpent-3-enyl)benzene; 1-methyl-4-(4-methyltridec-2-enyl)benzene; 1-((6*E*)-dodeca-2,6-dienyl)-4-methylbenzene; 1-*tert*-butyl-4-(2-methyl-5-*p*-tolylpent-3-enyl)benzene; 1-methyl-4-((4E)-3-methyl-5-(2,6,6-

trimethylcyclohex-1-en-1-yl)penta-2,4-dien-1-yl)benzene; 5-(3-*p*-tolylprop-1-enyl)benzo[*d*][1,3]dioxole; 2-(4-methyltridec-2-enyl)naphthalene; 4-(3-methyl-4-phenylbut-3-enyl)phenol; 2-ethoxy-4-(4-(4-hydroxyphenyl)-2-methylbut-1-enyl)phenol; 2-ethoxy-4-(4-(3-isopropylphenyl)pent-1-enyl)phenol; 2-ethoxy-4-(3-methyldodec-1-enyl)phenol; 2-ethoxy-4-((2-(2-(4-methylcyclohex-3-enyl)propyl)cyclopentylidene)methyl)-phenol; 2-(5-(3-isopropylphenyl)hex-2-en-2-yl)naphthalene; 2-((4*E*,8*Z*)-undeca-2,4,8-trien-2-yl)naphthalene; 2-((6*E*)-dodeca-2,6-dien-2-yl)naphthalene; 2-(4-methyltridec-2-en-2-yl)naphthalene; 2-(5,7,7-trimethyloct-2-en-2-yl)naphthalene; 4-(4-(3-isopropylphenyl)pent-1-enyl)-1,2-dimethoxybenzene; 1,2-dimethoxy-4-(4-(4-methoxyphenyl)-3-methylbut-1-enyl)benzene; 5-(4-(3-isopropylphenyl)pent-1-enyl)benzo[*d*][1,3]dioxole; 5-(4-(4-methoxyphenyl)-3-methylbut-1-enyl)benzo[*d*][1,3]dioxole; 5-(4-(4-*tert*-butylphenyl)-3-methylbut-1-enyl)benzo[*d*][1,3]dioxole; 1-methoxy-4-(3-(p-tolyl)prop-1-en-1-yl)benzene; 1-(tert-butyl)-4-(4-(4-methoxyphenyl)-2-methylbut-3-en-1-yl)benzene; 4-(4-(4-methoxyphenyl)-3-methylbut-3-en-1-yl)phenol; 1-isopropyl-3-(5-(4-methoxyphenyl)pent-4-en-2-yl)benzene; 1-isobutyl-4-(4-(4-methoxyphenyl)but-3-en-1-yl)benzene; 2-((11E)-trideca-2,11-dien-2-yl)naphthalene; 5-(4-phenylbut-1-en-1-yl)benzo[d][1,3]dioxole; 1,2-dimethoxy-4-(3-(4-(prop-1-en-2-yl)cyclohex-1-en-1-yl)allyl)benzene; 2-(5-(4-(tert-butyl)phenyl)-4-methylpent-2-en-2-yl)naphthalene; 2-((4E)-5,9-dimethyldeca-2,4,8-trien-2-yl)naphthalene; 2-(5-phenylpent-2-en-2-yl)naphthalene; 2-((4E)-tetradeca-2,4-dien-2-yl)naphthalene; 3-(3-(4-methoxyphenyl)-2-methylallyl)-2-pentylcyclopentanone; 1-methoxy-4-[(5E)-undeca-1,5-dien-1-yl]benzene; 1-methoxy-4-(3-methyldodec-1-en-1-yl)benzene; (1E)-1-[(4Z)-hepta-1,4-dien-1-yl]-4-methoxybenzene; (1Z)-1-[(4Z)-hepta-1,4-dien-1-yl]-4-methoxybenzene; and 4-[3-methyl-4-(m-tolyl)but-3-en-1-yl]phenol.

8. A consumer product comprising a compound of formula (I) as defined by claim 1 and a product base.

9. A product according to claim 8 wherein the consumer product is selected from home care products, personal care products and cleaning products.