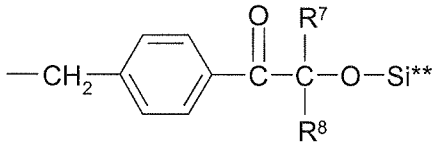


(I),

wherein

- R^1 and R^2 each independently designates an alkyl group of 1 to 12 carbon atoms or a cycloalkyl group of 5 or 6 carbon atoms or R^1 and R^2 form together with the carbon atom to which they are attached a cycloaliphatic ring of 5 or 6 carbon atoms,
- Si* represents an organopolysiloxane residue bonded via a silicon atom of this residue to the oxygen shown in formula (I), or a silane group $SiR^4R^5R^6$, wherein R^4, R^5 and R^6 each independently designates ~~an alkyl group of 1 to 12 carbon atoms,~~ a cycloalkyl group of 5 or 6 carbon atoms or an aryl group of 6 to 10 carbon atoms, and
- R^3 designates a hydrogen atom or a group represented by the following formula (II)



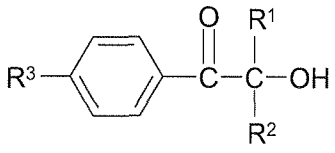
(II),

wherein

- R^7 and R^8 each independently designates an alkyl group of 1 to 12 carbon atoms or a cycloalkyl group of 5 or 6 carbon atoms or R^7 and R^8 form together with the carbon atom to which they are attached a cycloaliphatic ring of 5 or 6 carbon atoms, and
- Si** represents an organopolysiloxane residue bonded via a silicon atom of this residue to the oxygen shown in formula (II), or a silane group $SiR^9R^{10}R^{11}$, wherein R^9, R^{10} and R^{11} each independently designates an alkyl group of 1 to 12 carbon atoms, a cycloalkyl group of 5 or 6 carbon atoms or an aryl group of 6 to 10 carbon atoms.

These compounds are readily soluble in photocurable silicones and stable against thermal stress, UV radiation and hydrolysis and, hence, useful photoinitiators to produce cured products based on silicones which do not show yellowing even after a long time.

The present invention furthermore provides a convenient method to produce these compounds by reacting at least one α-hydroxy ketone of formula (I')



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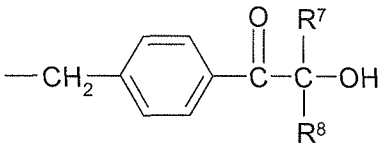

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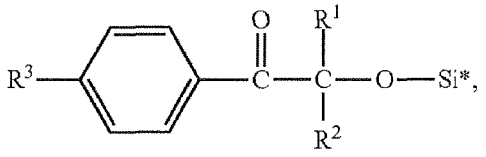
and at least one organopolysiloxane having at least one SiH group per molecule or at least one silane $HSiR^4R^5R^6$, wherein R^4, R^5 and R^6 each independently designates ~~an alkyl group of 1 to 12 carbon atoms,~~ a cycloalkyl group of 5 or 6 carbon atoms or an aryl group of 6 to 10 carbon atoms, in the presence of a dehydrogenation catalyst.

Another aspect relates to a compound represented by the following formula (I):

(I)



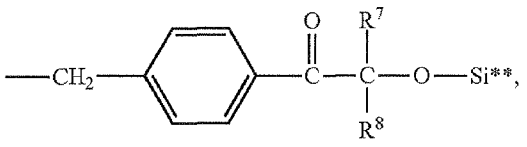
wherein

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

Si* represents an organopolysiloxane residue bonded via a silicon atom of this residue to the oxygen shown in formula (I), or a silane group $SiR^4R^5R^6$, wherein R^4, R^5 and R^6 each independently designates ethyl, n-propyl or isopropyl; and

R^3 designates a hydrogen atom or a group represented by the following formula (II)

(II)



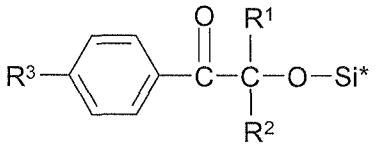
wherein

R^7 and R^8 form together with the carbon atom to which they are attached a cyclohexyl ring; and

Si** is identical to Si*.

Claims:

1. A compound represented by the following formula (I):



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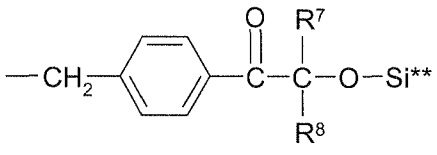
wherein

- R^1 and R^2 each independently designates an alkyl group of 1 to 12 carbon atoms or a cycloalkyl group of 5 or 6 carbon atoms or R^1 and R^2 form together with the carbon atom to which they are attached a cycloaliphatic ring of 5 or 6 carbon atoms,
- Si* represents an organopolysiloxane residue bonded via a silicon atom of this residue to the oxygen shown in formula (I), or a silane group $SiR^4R^5R^6$, wherein R^4, R^5 and R^6 each independently designates ~~an alkyl group of 1 to 12 carbon atoms,~~ a cycloalkyl group of 5 or 6 carbon atoms or an aryl group of 6 to 10 carbon atoms, and
- R^3 designates a hydrogen atom or a group represented by the following formula (II)



(II),

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- Si** represents an organopolysiloxane residue bonded via a silicon atom of this residue to the oxygen shown in formula (II), or a silane group $SiR^9R^{10}R^{11}$, wherein R^9, R^{10} and R^{11} each independently designates an alkyl group of 1 to 12

carbon atoms, a cycloalkyl group of 5 or 6 carbon atoms or an aryl group of 6 to 10 carbon atoms.

2. The compound according to claim 1, wherein R^1 and R^2 each independently designates methyl, ethyl, n-propyl or isopropyl.

3. The compound according to claim 1, wherein R^1~~R1~~ and R^2~~R2~~ form together with the carbon atom to which they are attached a cyclohexyl ring.

4. The compound according to any of claims 1 to 3, wherein R^3~~R3~~ designates a hydrogen atom.

5. The compound according to any of claims 1 to 3, wherein ~~R3~~R^3 designates a group represented by formula (II), wherein ~~R7~~R^7 and ~~R8~~R^8 are identical to ~~R1~~ R^1 and ~~R2~~R^2.

6. The compound according to claim 1, wherein Si* represents a silane group ~~SiR4R5R6~~$SiR^4R^5R^6$, wherein ~~R4, R5 and R6~~ R^4, R^5 and R^6 each independently designates an aryl group selected from phenyl and benzyl~~methyl, ethyl, n-propyl or isopropyl~~.

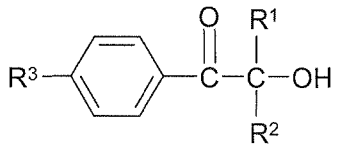
7. The compound according to claim 1, wherein ~~R3~~R^3 designates a group represented by formula (II), wherein Si** is identical to Si*.

8. The compound according to claim 1, wherein ~~R1~~R^1 and ~~R2~~R^2 each designates methyl and ~~R3~~ R^3 designates a hydrogen atom.

9. The compound according to claim 1, wherein ~~R1~~R^1 and ~~R2~~R^2 form together with the carbon atom to which they are attached a cyclohexyl ring and ~~R3~~ R^3 designates a hydrogen atom.

10. The compound according to claim 1, wherein ~~R1~~R^1 and ~~R2~~R^2 each designates methyl and ~~R3~~R^3 designates a group represented by formula (II), wherein ~~R7~~ R^7 and ~~R8~~R^8 each designate methyl.

11. A method to produce a compound according to any of claims 1 to 10, by reacting at least one α-hydroxy ketone of formula (I')



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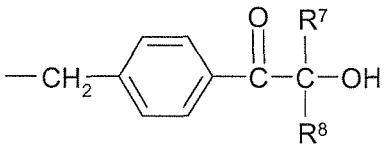
- R^3 designates a hydrogen atom or a group represented by the following formula (II')



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and at least one organopolysiloxane having at least one SiH group per molecule or at least one silane $HSiR^4R^5R^6$, wherein R^4, R^5 and R^6 each independently designates ~~an alkyl group of 1 to 12 carbon atoms,~~ a cycloalkyl group of 5 or 6 carbon atoms or an aryl group of 6 to 10 carbon atoms, in the presence of a dehydrogenation catalyst.

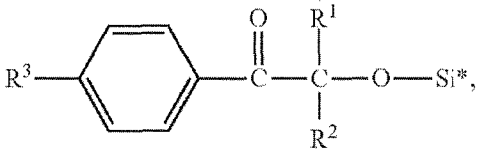
12. The method according to claim 11, wherein the α-hydroxy ketone of formula (I') and the organopolysiloxane having at least one SiH group per molecule or the silane ~~HSiR4R5R6~~ $HSiR^4R^5R^6$ are reacted in respective amounts to provide a molar ratio of hydroxyl groups of the α-hydroxy ketone of formula (I') to SiH groups of 0.8 to 1.2.

13. A method according to ~~any of~~ claim~~s~~ 11 ~~and~~ or claim 12, wherein the dehydrogenation catalyst is selected from tris(pentafluorobenzene)borane, zinc dust, and platinum catalysts.

14. A method according to ~~any of~~ claim~~s~~ 11 ~~and~~ or claim 12, wherein the reaction is carried out at a temperature of from 20 to 100°C.

15. A compound represented by the following formula (I):

(I)



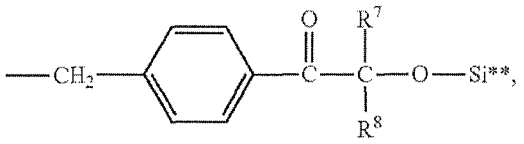
wherein

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

Si* represents an organopolysiloxane residue bonded via a silicon atom of this residue to the oxygen shown in formula (I), or a silane group $SiR^4R^5R^6$, wherein R^4, R^5 and R^6 each independently designates ethyl, n-propyl or isopropyl; and

R^3 designates a hydrogen atom or a group represented by the following formula (II)

(II)



wherein

R^7 and R^8 form together with the carbon atom to which they are attached a cyclohexyl ring; and

Si** is identical to Si*.

16. The compound according to claim 15, wherein R^3 designates a hydrogen atom.

~~15~~17. A method of using the compound according to any one of claims 1 to 10, 15 and 16 as photoinitiator and/or photosensitizer, comprising addition of the compound to a photopolymerizable organopolysiloxane or silicone resin and exposure of the resulting mixture to electromagnetic radiation.