A first example disclosed herein relates to a process for producing an alpha-hydroxy reaction product of the formula I:

(R)CH(R')-CHOH-COOR'' (I)

Wherein

R is -H or -CH_3;

R' is -CH_3, -CH_2CH_3, - $CH(CH_3)_2$, -C_6H_5, -CH_2SCH_3, -C_8H_6N or -$C_3H_3N_2$; and

R'' is -H, -CH_3, -CH_2CH_3, -$CH(CH_3)_2$, -$CH_2CH_2CH_3$, -$CH_2CH_2CH_2CH_3$, -$CH_2CH(CH_3)_2$, or -$C(CH_3)_3$;

CLAIMS

1. A process for producing an alpha-hydroxy reaction product of the formula I:

$(R)CH(R')-CHOH-COOR''$ (I)

Wherein

R is -H or $-CH_3$;

R' is $-CH_3$, $-CH_2CH_3$, $-CH(CH_3)_2$, $-C_6H_5$, $-CH_2SCH_3$, $-C_8H_6N$ or $-C_3H_3N_2$; and

R'' is -H, $-CH_3$, $-CH_2CH_3$, $-CH(CH_3)_2$, $-CH_2CH_2CH_3$, $-CH_2CH_2CH_2CH_3$, $-CH_2CH(CH_3)_2$, or $-C(CH_3)_3$

Comprising the steps of

a) Providing a first compound of the formula II:

$CH_2OH-CHO$ (II)

b) Providing a second compound of the formula III:

R-CO-R' (III)

Wherein

R and R' have the meanings as defined above;

c) Reacting the first compound with the second compound in the presence of a Lewis acid catalyst to provide the alpha-hydroxy reaction product.

2. The process according to claim 1, wherein the alpha-hydroxy reaction product is an amino acid analog.
3. The process according to claim 1 or 2, wherein R is CH_3.
4. The process according to claim 1 or 2, wherein R is H.
5. The process according to any one of the preceding claims, wherein R'' is -H, $-CH_3$, $-CH_2CH_3$, or $-CH(CH_3)_2$.
6. The process according to any one of the preceding claims, wherein the Lewis acid catalyst has a framework structure, which is selected from the group consisting of BEA, MFI, FAU, MOR, FER, MWW, MCM-41 and SBA-15.
7. The process according to any one of the preceding claims, wherein the Lewis acid catalyst comprises one or more active metals selected from the group consisting of Sn, Ti, Pb, Zr, Ge and Hf.

8. The process according to any one of the preceding claims, wherein the Lewis acid catalyst is Sn-BEA.
9. The process according to any one of the preceding claims, wherein the Lewis acid catalyst is Sn-MCM-41.
10. The process according to claims 1 to 4, wherein the Lewis Acid catalyst is a soluble tin salt.
11. The process according to any one of the preceding claims, wherein in step c), the first and second compounds are reacted at a temperature in the range of from 30 to 220 °C, such as in the range of from 60 to 180 °C.
12. The process according to any one of the preceding claims, wherein step c) is carried out in a solvent.
13. The process according to claim 12, wherein the solvent is selected from the group consisting of water, methanol, ethanol, propanol, isopropanol, n-butanol, tert-butanol acetone, benzaldehyde, butanone, isobutyraldehyde, 1H-imidazole-4-carbaldehyde, 1H-indole-3-carbaldehyde and methylsulfanyl-acetaldehyde; or mixtures thereof.
14. The process according to any one of the preceding claims, wherein in step c) a methyl vinyl glycolate by-product is formed and the molar ratio of alpha-hydroxy reaction product to methyl vinyl glycolate in the range of from 1:1 to 100:1, such as in the range of from 2:1 ot 100:1.
15. The process according to any one of the preceding claims, comprising a subsequent step d) of recovering the alpha hydroxy reaction product.
16. The process according to claim 15 wherein the alpha-hydroxy reaction product is recovered by distillation and/or extraction.
17. The process according to claim 14, wherein in step d) the alpha hydroxy reaction product is separated from the methyl vinyl glycolate by distillation and/or extraction.
18. The process according to any one of the preceding claims, comprising a further step e) of aminating the alpha hydroxy reaction product into the corresponding amino acid.
19. The process according to any one of the preceding claims, wherein no other aldehydes or ketones are present in step c, than the first and second compounds.