

Claims

1. A method for producing ketones which method comprises the steps of:
 - a) providing a feedstock of biological origin comprising fatty acids and/or fatty acid derivatives having an average chain length of 24 C-atoms or less,
 - b) subjecting said feedstock to a catalytic ketonisation reaction performed under a gas pressure of from 0.5 MPa to 5 MPa in the presence of a K_2O/TiO_2 -catalyst,
 - c) obtaining from said ketonisation reaction a product stream comprising ketones, which ketones have a longer average hydrocarbon chain length than the average hydrocarbon chain length in said feedstock,

wherein the feedstock is at least partly in liquid form when entered into the ketonisation step, and the liquid feed flow rate WHSV is from 0.1 to 10 h^{-1} ; and wherein the catalytic ketonisation reaction applied is carried out directly on said feedstock using said K_2O/TiO_2 -catalyst as the sole catalyst present during said ketonisation reaction.

2. The method according to claim 1 wherein the catalytic ketonisation reaction applied is carried out directly on said feedstock without preceeding or simultaneous hydrogenation of the double bonds present in the fatty acids and/or fatty acid derivatives in said feedstock.
3. The method according to any of claims 1 and 2 wherein said ketonisation reaction is performed by introducing the feedstock in liquid phase.
4. The method according to any of the previous claims wherein said feedstock of biological origin comprises unsaturated fatty acids and/or fatty acid derivatives, such as esters.

5. The method according to any of claims 1 to 4 wherein said ketonisation reaction is performed under a pressure of from 1 MPa to 3 MPa, e.g. from 1.5 to 2 MPa.
 6. The method according to any of claims 4 and 5 wherein said gas pressure is achieved by hydrogen or nitrogen or any other suitable gas.
 7. The method according to any of the previous claims wherein said K_2O/TiO_2 - catalyst is supported on alumina, silica or active carbon.
 8. The method according to any of the previous claims wherein said ketonisation reaction is performed in a temperature ranging from 150 °C to 400 °C, such as 200 °C to 375 °C, e.g. 250 °C to 350 °C or 275 °C to 325 °C; and/or the liquid feed flow rate WHSV is from 0.2 to 5 h⁻¹, e.g. from 0.5 to 1 h⁻¹.
 9. The method according to any of the previous claims wherein the method further comprises:
 - d) a hydrodeoxygenation step wherein said ketones obtained from said ketonisation reaction are hydrodeoxygenated
 - e) an optional isomerisation step and
 - f) optional step(s) of further after-treatment.
 10. The method according to claim 9 wherein said hydrodeoxygenation step is carried out in the presence of a Pd, Pt, Ni, NiMo, NiW or CoMo catalyst optionally being supported, e.g. on alumina, silica or active carbon.
- 5
11. The method according to any one of claims 9 or 10 wherein said optional isomerisation step is carried out in the presence of a Pd, Pt or Ni metal catalyst, e.g. a Pt-SAPO or Pt-ZSM catalyst.
 12. The method according to any one of claims 9 to 11 wherein said hydrodeoxygenation step and said optional isomerisation step are carried out

in the same reaction zone as said ketonisation reaction or in separate reaction zone(s) subsequent to said ketonisation reaction zone.