

Claims

1. A process for the production of a hydrocarbon product comprising contacting a feedstock comprising at least one oxygenated aromatic compound, in the presence of hydrogen, with :
 - a) a metal hydrogenation catalyst and
 - b) a solid acid catalyst having a pKa < 5.2 which is active for the deoxygenation of oxygenated hydrocarbons
2. A process as claimed in claim 1, wherein said metal hydrogenation catalyst is selected from the group consisting of platinum, palladium, nickel, cobalt, copper, ruthenium, rhodium and rhenium and mixtures thereof.
3. A process as claimed in claim 1 or claim 2, wherein said metal hydrogenation catalyst is present in dispersed form supported on particles of a support material.
4. A process as claimed in claim 3, wherein said support material comprises particles of said solid acid catalyst.
5. A process as claimed in claim 3, wherein said support material comprises particles of a material selected from the group consisting of silica-alumina, silica, a transition alumina, carbon, titania, zirconia and mixtures of two or more of these materials.
6. A process as claimed in any one of the preceding claims, wherein said solid acid catalyst comprises at least one material selected from the group consisting of a zeolite, clay, acid treated metal oxide, acid treated mixed metal oxide, supported heteropoly acid, metal oxide, mixed metal oxide, alumina-silicate, ~~alumina~~-silica, silico-alumino-phosphate, sulphated carbon, proton exchange membrane, acidic ion exchange resin and immobilised Lewis acid catalyst.
7. A process as claimed in any one of the preceding claims, wherein said hydrocarbon product comprises at least one cyclic aliphatic hydrocarbon.
8. A process according to any one of the preceding claims wherein the reaction temperature is in the range from 50 – 400 °C.
9. A process according to any one of the preceding claims wherein, in a first step, the oxygenated aromatic feedstock, in the presence of hydrogen, is contacted with a metal hydrogenation catalyst and then, in a second step, the product of said first step is contacted with a solid acid catalyst which is active for the deoxygenation of oxygenated hydrocarbons.
10. A process according to claim 9, wherein said first step is carried out at a higher temperature than said second step.
11. A process according to claim 9 or claim 10, wherein said second step is carried out at a temperature of 225 °C or less.
12. A process according to any one of claims 9 – 11, wherein said second step is carried out in the presence of hydrogen.

13. A process according to claim 12, wherein said second step is carried out in the presence of a metal hydrogenation catalyst.

14. A process according to any one of claims 1 – 8, wherein said process is carried out in a single step such that said feedstock is contacted with hydrogen, and a catalyst composition comprising both:

a) a metal hydrogenation catalyst and

b) a solid acid catalyst which is active for the deoxygenation of oxygenated hydrocarbons

present in the same catalyst bed.

15. A process according to any one of claims 1 - 14, wherein the reaction temperature in contact with the second catalyst is not greater than 250 °C.