CLAIMS

1. A hydrotreatment process comprising:

   a. providing in a reactor a liquid feedstock;

   b. hydrotreating the liquid feedstock in liquid phase and at a temperature selected from the range 280-380°C in the presence of 10-500ppm of catalytic $MoS_2$ microparticle slurry, to provide a liquid reaction product with decreased heteroatom content; and wherein

   at least 90% of the catalytic $MoS_2$ microparticles in the $MoS_2$ microparticle slurry have a size below 7µm, wherein the size of a microparticle is expressed as an average of the longest dimension and the shortest dimension of the microparticle.

2. The hydrotreatment process of claim 1, wherein the feedstock contains about 1-40wt-% oxygen, preferably 5-40wt-% oxygen.

3. The hydrotreatment process of claim 1 or 2, wherein the feedstock contains at least one of: crude tall oil, tall oil pitch, crude fatty acid, tall oil fatty acid, distilled tall oil, liquefied lignocellulosic biomass, bio-oil, biocrude, liquefied waste polymer, or a combination thereof.

4. The hydrotreatment process of any one of claims 1-3, wherein the temperature is selected from the range 320-370°C, preferably from the range 330-360°C.

5. The hydrotreatment process of any one of claims 1-3, wherein the feedstock contains liquefied polymer waste and the temperature is selected from the range 280-320°C, preferably from the range 290-310°C.

6. The hydrotreatment process of any one of claims 1-5, wherein the hydrotreating step is carried out at a pressure selected from the range 70-200bar such that the feedstock is in liquid phase.

7. The hydrotreatment process of any one of claims 1-6, wherein the feedstock contains liquefied polymer waste and the pressure is selected from the range 70-90bar, preferably from the range 75-85bar.

8. The hydrotreatment process of any one of claims 1-7, wherein the pressure is controlled by feeding hydrogen gas into the reactor.

9. The hydrotreatment process of any one claims 1-8, wherein the hydrotreatment removes at least 50% of sulphur, at least 40% of nitrogen, and optionally at least 50% of oxygen from the feedstock.

10. The hydrotreatment process of any one of claims 1-9, wherein the catalytic $MoS_2$ microparticles are provided in at least partially crystalline form in the reactor.

11. The hydrotreatment process of any one of claims 1-10, wherein the $MoS_2$ microparticle slurry is used in an amount of 10 ppm – 2 wt-%, based on the amount of Mo in the total amount of the reaction mixture in the reactor.

12. The hydrotreatment process of any one claims 1-10, wherein the feedstock contains liquefied polymer waste and the $MoS_2$ microparticle slurry is used in an amount of 10ppm – 500ppm, based on the amount of Mo in the total amount of the reaction mixture in the reactor.

~~13. The hydrotreatment process of any one of claims 1-12, wherein at least 90% of the catalytic $MoS_2$ microparticles have a size below 7µm, and wherein the size of a microparticle is expressed as an average of the longest dimension and the shortest dimension of the microparticle.~~

~~14.~~13. The hydrotreatment process of any one of claims 1-1~~3~~2, wherein at least 90% of the particles have an aspect ratio of 0.40-1.0.

~~15.~~14. The hydrotreatment process of any one of claims 1-1~~4~~3, wherein the reaction product predominantly contains hydrocarbons having a maximum boiling point of 565°C at atmospheric pressure.

~~16.~~15. The hydrotreatment process of any one of claims 1-1~~5~~4, wherein the process is carried out in a stirred tank reactor.

~~17.~~16. A process for manufacturing catalytic molybdenum sulphide microparticles comprising:

a. providing in a hydrocarbon solvent a Mo precursor and a $H_2S$ source to provide a reaction mixture;

b. hydrogenating, under vigorous stirring, the reaction mixture at a temperature of at least 180°C, such that the combination of temperature and pressure is sufficient for evaporating water in the reaction mixture.

~~18.~~17. The process of claim 1~~7~~6, wherein the Mo precursor is selected from molybdenum 2-ethyl hexanoate, carboxylate anion of 3-cyclopentylpropionic acid, cyclohexanebutyric acid, biphenyl-2-carboxylic acid, 4-heptylbenzoic acid, 5-phenylvaleric acid, and geranic acid (3,7-dimethyl-2,6-octadienoic acid).

~~19.~~18. The process of any one of claims 1~~7~~6-1~~8~~7, wherein the $H_2S$ source is selected from dimethyl disulphide, dimethyl sulphide, disulphide, alkyl disulphide, polysulphide, di-tert-dodecyl polysulphide, mercaptan, n-butyl mercaptan, $H_2S$ gas, and any combination thereof.

~~20.~~19. The process of any one of claims 1~~7~~6-1~~9~~8 wherein an amount of $H_2S$ source and an amount of Mo precursor is used, which provides a molar excess of sulphur to molybdenum, such as at least 4 mol S / mol Mo, at least 5 mol S / mol Mo, at least 6 mol S / mol Mo, at least 7 mol S / mol Mo, or 4-7 mol S / mol Mo, or 5-6 mol S / mol Mo.