C L A I M S

1. A method of subjecting a biomass feedstock to hydropyrolysis, the method at least comprising the steps of:

a) supplying a biomass feedstock and a fluidizing gas comprising hydrogen to a bulk reactor zone of a fluidized bed reactor containing a deoxygenating catalyst;

b) subjecting the biomass feedstock in the bulk reactor zone of the fluidized bed reactor to a hydropyrolysis reaction by contacting the biomass feedstock with the deoxygenating catalyst in the presence of the fluidizing gas, thereby obtaining a hydropyrolysis reactor output comprising at least one non-condensable gas, a partially deoxygenated hydropyrolysis product and char;

wherein the fluidized bed reactor further comprises a plurality of tubes running through the bulk reactor zone and at least a portion of a mixing zone of the bulk reactor located below the bulk reactor zone, and

wherein cooling fluid flowing in the tubes at a point where the biomass feedstock enters the bulk reactor zone has a temperature of at least 320°C.

2. The method according to claim 1, wherein the biomass feedstock contacts the deoxygenating catalyst in the bulk reactor zone at an operation temperature in the range of from 320°C to 500°C.

3. The method according to claim 2, wherein the cooling fluid flowing in the tubes at the point where the biomass feedstock enters the bulk reactor zone has a temperature

that is at least 20°C lower than the operation temperature in the bulk reactor zone.

4. The method according to claim 1, wherein the cooling fluid flowing in the tubes at the point where the biomass feedstock enters the bulk reactor zone has a temperature that is lower than the temperature of the hydropyrolysis reactor output when it leaves the bulk reactor zone.

5. The method according to claim 1, wherein the cooling fluid flowing in the tubes at the point where the biomass feedstock enters the bulk reactor zone has a temperature of at most 480°C.

6. The method according to claim 1, wherein the cooling fluid comprises a molten salt.

7. The method according to claim 1, wherein the biomass feedstock contacts the deoxygenating catalyst in the bulk reactor zone at a pressure in the range of from 0.50 MPa to 7.50 MPa.

8. The method according to claim 1, wherein the method further comprises before step a) the steps of:

i) supplying the biomass feedstock, the fluidizing gas and a catalyst recirculation stream comprising deoxygenating catalyst to the mixing zone of the fluidized bed reactor;

ii) allowing the biomass feedstock, the fluidizing gas and the deoxygenating catalyst to move upwards through the fluidized bed reactor from the mixing zone to the bulk reactor zone; and

iii) withdrawing at least a portion of the deoxygenating catalyst from the bulk reactor zone to form

the catalyst recirculation stream that is supplied to the mixing zone in step i).

9. The method of claim 8, wherein step a) comprises feeding the biomass feedstock into the mixing zone through an inlet that is located above an inlet for the fluidizing gas.

10. The method according to claim 1, wherein the method further comprises the steps of:

c) removing substantially all char from the hydropyrolysis reactor output to provide a purified hydropyrolysis reactor vapor stream;

d) hydroconverting at least a portion of the purified hydropyrolysis reactor vapor stream in a hydroconversion reactor comprising a hydroconversion catalyst to produce a hydroconversion reactor output; and

e) recovering a substantially fully deoxygenated hydrocarbon liquid and a gaseous mixture from the hydroconversion reactor output.

11. The method of claim 1, wherein the cooling fluid flowing in the tubes at the point where the biomass feedstock enters the bulk reactor zone has a temperature that is less than an outlet temperature of the bulk reactor zone.

12. The method of claim 1, comprising mixing the biomass feedstock with the fluidizing gas in the mixing zone before supplying the biomass feedstock and the fluidizing gas to the bulk reaction zone.

13. The method of claim 1, wherein the mixing zone makes up 4% to 30% of a total reactor volume.