

CLAIMS

1. A process for cracking a hydrocarbon feedstock in a steam cracker unit, comprising the following steps of:

5 feeding a hydrocarbon feedstock to a first hydrocracking unit, wherein said first hydrocracking unit is operated as a ring opening hydrocracker unit at a temperature of 200-600 °C and a pressure of 3-35 MPa,

feeding the hydrocarbon feedstock thus cracked to a separation unit for obtaining a stream high in paraffins and naphtenes, a stream high in heavy aromatics and a stream high in mono-aromatics

10 feeding the stream high in paraffins and naphtenes to a second hydrocracking unit, wherein said second hydrocracking unit is operated at a temperature of 300-550 °C, a pressure of 300-5000 kPa gauge and a Weight Hourly Space Velocity of 0.1-10 h⁻¹, the temperature in the first hydrocracking unit being lower than the temperature in the second hydrocracking unit,

separating the stream thus hydrocracked in the second hydrocracking unit in a high content aromatics stream and gaseous stream comprising C2-C4 paraffins, hydrogen and methane,

20 feeding the gaseous stream to a steam cracker unit and cracking said gaseous stream in said steam cracker unit.

2. The process according to claim 1, further comprising returning said stream high in heavy aromatics to the first hydrocracking unit.

3. The process according to claim 1, further comprising separating C2-C4 paraffins from said gaseous stream, and

25 feeding said C2-C4 paraffins thus separated to the furnace section of a steam cracker unit.

4. The process according to any one or more 1-3, wherein separating said C2-C4 paraffins from said gaseous stream is carried out by cryogenic distillation or solvent extraction.

30 5. The process according to claims 1-4, further comprising recovering mono-aromatics from said stream high in heavy aromatics before returning said stream high in heavy aromatics to the first hydrocracking unit.

6. The process according to claims 1-5, wherein the separation unit comprises a distillation unit and an extraction unit, wherein the top stream from the distillation unit is sent to the inlet of said extraction unit.

7. The process according to claims 1-6, further comprising returning said high content aromatics stream to said separation unit, preferably to the inlet of said extraction unit.

8. The process according to any one or more of the claims 1 - 7 wherein the hydrogen partial pressure in the first hydrocracking unit is higher than the hydrogen partial pressure in the second hydrocracking unit.

9. The process according to any one or more of the preceding claims, wherein the reactor type design of the first and second hydrocracking unit is chosen from the group of the fixed bed type, ebulating bed reactor type and the slurry type, especially the reactor type design of both the first and second hydrocracking unit is of the fixed bed type.

10. The process according to any one or more of the preceding claims, wherein the hydrocarbon feedstock to said first hydrocracking unit is of the type naphtha, kerosene, diesel, atmospheric gas oil (AGO), waxes, vacuum gas oil (VGO), atmospheric residue, vacuum residue and gas condensates, or combinations thereof, especially naphtha and diesel.

11. The process according to any one or more of the preceding claims, wherein said first hydrocracking unit is operated at a temperature of 300-400 °C, a pressure of 5 to 20MPa.

12. The process according to any one or more of the preceding claims, wherein said second hydrocracking unit is operated at a temperature of 300-450 °C, a pressure of 300-5000 kPa gauge and a Weight Hourly Space Velocity of 0.1-10 h⁻¹, preferably a temperature of 300-400 °C, a pressure of 600-3000 kPa gauge and a Weight Hourly Space Velocity of 0.2-2 h⁻¹.