CLAIMS

1. A process for upgrading refinery heavy residues to petrochemicals comprising:

separating crude oil in a crude oil distillation unit into an overhead stream, a side stream and a bottom stream,

feeding said bottom stream to a resid FCC unit area,

separating reaction products, which are generated from said reaction area of step (b) into a stream rich in mono-aromatics and in a stream rich in poly-aromatics,

feeding said stream rich in mono-aromatics to a gasoline hydrocracker (GHC) unit,

wherein the process conditions prevailing in said gasoline hydrocracker (GHC) unit are a reaction temperature of 300-580 °C, a pressure of 0.3-5 MPa gauge and a Weight Hourly Space Velocity (WHSV) of 0.1-10 h-1, and separating reaction products of said GHC into an overhead gas stream, comprising C2-C4 paraffins, hydrogen and methane and a bottom stream comprising aromatic hydrocarbon compounds and non-aromatic hydrocarbon compounds,

feeding said stream rich in poly-aromatics to a ring opening reaction area, wherein the process conditions prevailing in said reaction area for ring opening are a temperature from 100 °C to 500 °C and a pressure from 2 to 10 MPa together with from 50 to 300 kg of hydrogen per 1,000 kg of feedstock over an aromatic hydrogenation catalyst and passing the resulting stream to a ring cleavage unit at a temperature from 200 °C to 600 °C and a pressure from 1 to 12 MPa together with from 50 to 200 kg of hydrogen per 1,000 kg of said resulting stream over a ring cleavage catalyst, and

feeding effluent of the ring-opening process is highly mono-aromatic and to the GHC unit for further upgrading into LPG.

2. The process as set forth in claim 1, further comprising feeding an overhead stream from the gasoline hydrocracker unit into a steam cracker unit.

3. The process as set forth in claim 1, wherein atmospheric residue is not sent to a vacuum

distillation unit for further fractionation of the resid.

4. The process as set forth in claim 2, further comprising the step of pretreating said stream rich in poly-aromatics in an aromatics extraction unit, from which aromatics extraction unit its bottom stream is fed into said reaction area for ring opening and its overhead stream is fed into said steam cracker unit.

5. The process as set forth in claim 2, further comprising the step of feeding a light fraction of reaction products formed in the reaction area for ring opening into said steam cracker unit.

6. The process as set forth in claim 4, wherein said aromatics extraction unit is a distillation unit.

7. The process as set forth in claim 4, wherein said aromatics extraction unit is a solvent extraction unit, wherein in said solvent extraction unit, its overhead stream is washed for

removal of solvent, wherein the thus recovered solvent is returned into said solvent extraction unit and the overhead stream thus washed is fed into said steam cracker unit.

8. The process as set forth in claim 4, wherein said aromatics extraction unit is of the molecular sieve type.

9. The process as set forth in claim 1, further comprising the step of pretreating said bottom stream from said distillation unit in a vacuum distillation unit, in which vacuum distillation unit said feed is separated in an overhead stream and a bottom stream, and feeding said bottom stream into a hydrocracking area or a resid FCC unit.

10. The process as set forth in claim 9, further comprising the step of feeding said overhead stream from said vacuum distillation unit to an aromatics extraction unit or to said reaction area for ring opening, or a combination thereof.

11. The process as set forth in claim 2, further comprising feeding an overhead stream from an aromatics extraction unit into an isomerization unit and feeding the thus isomerized stream to said steam cracking unit.

12. The process as set forth in claim 2, further comprising recovering C2-C4 paraffins to form a steam rich in paraffins and feeding the stream rich in paraffins coming from a separation section into an isomerization unit and feeding the thus isomerized stream to said steam cracking unit.

13. The process as set forth in claim 12, wherein atmospheric residue of the bottom stream of the crude oil distillation unit is not sent to a vacuum distillation unit for further fractionation of the resid.