

CLAIMS

1. An integrated hydrocracking process for production of olefinic and aromatic petrochemicals from a hydrocarbon feedstock comprising crude oil, the process comprising:

treating the hydrocarbon feedstock comprising crude oil and a residual liquid product in a first hydrocracking zone in the presence of hydrogen under effective conditions producing a first effluent having an increased hydrogen content;

separating the first effluent into a liquefied petroleum gas (LPG) comprising stream and a liquid phase stream;

separating said LPG comprising stream into one or more streams chosen from a stream comprising hydrogen, a stream comprising methane, a stream comprising ethane, a stream comprising butanes, a stream comprising propane, a stream comprising C1-minus, a stream comprising C3-minus, a stream comprising C1-C2, a stream comprising C3-C4, a stream comprising C2-C3, a stream comprising C1-C3, a stream comprising C1-C4, a stream comprising C2-C4, a stream comprising C2-minus and a stream comprising C4-minus;

further processing said one or more streams in a steam cracker unit and at least one unit chosen from the group of a butanes dehydrogenation unit, a propane dehydrogenation unit, a combined propane-butanes dehydrogenation unit, and a combination of units thereof to produce mixed product stream(s);

feeding the mixed product stream(s) from said steam cracker unit and said at least one unit, chosen from the group of said butanes dehydrogenation unit, said propane dehydrogenation unit, said combined propane-butanes dehydrogenation unit, and said combination of units thereof, to a second separation section;

thermally cracking at least a portion of the liquid phase stream in a resid hydrocracking zone to produce a slurry intermediate product; and separating the mixed product stream(s).

2. The process according to claim 1, further comprising feeding at least one stream chosen from said stream comprising ethane, said stream comprising C1-C2 and said stream comprising C2-minus to said steam cracker unit.

3. The process according to claim 1, further comprising feeding at least one stream chosen from said stream comprising propane, said stream comprising C3-C4, said stream comprising C3-minus, said stream comprising butanes, said stream comprising C4-minus, said stream comprising C2-C3, said stream comprising C1-C3, said stream comprising C1-C4 and said stream comprising C2-C4 to at least one dehydrogenation unit chosen from the group of said butanes dehydrogenation unit, said propane dehydrogenation unit, said combined propane-butanes dehydrogenation unit, and a combination of units thereof.

4. The process according to claim 1, further comprising recovering olefins and aromatics from the separated mixed product stream(s).

5. The process according to claim 1, further comprising:

treating at least a portion of said liquid phase stream in a second hydrocracking zone in the presence of hydrogen under effective conditions to produce a second effluent having an increased hydrogen content; and

recovering from the second effluent from said second hydrocracking zone a stream comprising a mixture of benzene, toluene, xylenes, and ethyl benzene (BTXE), a second LPG comprising stream and said residual liquid product.

6. The process according to claim 5, further comprising combining the LPG comprising stream separated from said first effluent with the second LPG comprising stream recovered from said second effluent.

7. The process according to claim 5, further comprising recovering vapor products from the slurry intermediate product and combining the vapor products thus recovered with the LPG comprising stream separated from first effluent.

8. The process according to claim 5, further comprising separating from the first effluent originating from said first hydrocracking zone and the second effluent originating

from said second hydrocracking zone residual liquid fractions and recycling said residual liquid fractions to an inlet of the first hydrocracking zone and/or second hydrocracking zone.

9. The process according to claim 1, further comprising recovering methane from the separated mixed product stream(s) and recycling said methane to the steam cracker to be used as fuel for burners and/or heaters.

10. The process according to claim 5, further comprising recovering and purifying hydrogen from the separated mixed product stream(s) and recycling it to an inlet of the first and/or second hydrocracking zone.

11. The process according to claim 5, further comprising recovering pyrolysis fuel oil from the separated mixed product stream(s) and recycling said pyrolysis fuel oil to an inlet of said first and/or second hydrocracking zone.