CLAIMS

1. A process for increasing the yields of aromatics from a hydrocarbon feedstream, comprising:

passing the hydrocarbon feedstream to a first reactor system operated at a first set of dehydration reaction conditions to convert naphthenes to aromatics, including a first reaction temperature in the range of 440°C to 560°C and a pressure in the range of 130kPa to 310kPa, to generate a hydrocarbon stream with a reduced naphthenic content;

passing the reduced naphthene hydrocarbon stream to a second reactor system operated at a second set of reaction conditions, including a temperature in the range 540°C to 600°C and a pressure of less than 450kPa, to cyclize and aromatize the paraffinic compounds to generate an aromatic process stream; and

passing the aromatic process stream to a reformate splitter to generate a reformate overhead comprising C6, C7 aromatics and lighter hydrocarbons, and a reformate bottoms stream comprising C8 and heavier hydrocarbons.

2. The process of claim 1 where the first reactor system is a dehydrogenation reactor system and the reaction conditions include dehydrogenation conditions, and the second reactor system is a reforming reactor system and the reaction conditions include reforming reaction conditions.

3. The process of claim 1 or 2 further comprising passing the reformate overhead to an aromatics separation unit to generate an aromatics product stream and a raffinate stream.

4. The process of claim 2 wherein the reforming reactor system comprises a plurality of reforming reactors with inter-reactor heaters.

5. The process of claim 4 wherein the inter-reactor heaters raise the temperature of the reduced naphthene hydrocarbon stream to a temperature of at least 540°C.

6. The process of claim 1 wherein the first set of conditions include a temperature in the range 445°C to 475°C.

7. The process of claim 2 wherein the dehydrogenation reactor is a reforming reactor system, wherein the first reaction temperature is lower than the elevated temperature.

8. The process of claim 3 further comprising passing the raffinate stream to the reforming reactor system.

9. The process of claim 3 further comprising passing the raffinate stream to the dehydrogenation reactor system.

CLAIMS

1. A process for increasing the yields of aromatics from a hydrocarbon feedstream, comprising:

passing the hydrocarbon feedstream to a first reactor system operated at a first set of dehydration reaction conditions to convert naphthenes to aromatics, including a first reaction temperature in the range of 440°C to 560°C and a pressure in the range of 130kPa to 310kPa, to generate a hydrocarbon stream with a reduced naphthenic content;

passing the reduced naphthene hydrocarbon stream to a second reactor system operated at a second set of reaction conditions, including a temperature in the range 540°C to 600°C and a pressure of less than 450kPa, to cyclize and aromatize the paraffinic compounds to generate an aromatic process stream; and

passing the aromatic process stream to a reformate splitter to generate a reformate overhead comprising C6, C7 aromatics and lighter hydrocarbons, and a reformate bottoms stream comprising C8 and heavier hydrocarbons.

2. The process of claim 1 where the first reactor system is a dehydrogenation reactor system and the reaction conditions include dehydrogenation conditions, and the second reactor system is a reforming reactor system and the reaction conditions include reforming reaction conditions.

3. The process of claim 1 or 2 further comprising passing the reformate overhead to an aromatics separation unit to generate an aromatics product stream and a raffinate stream.

4. The process of claim 2 wherein the reforming reactor system comprises a plurality of reforming reactors with inter-reactor heaters.

5. The process of claim 4 wherein the inter-reactor heaters raise the temperature of the reduced naphthene hydrocarbon stream to a temperature of at least 540°C.

6. The process of claim 1 wherein the first set of conditions include a temperature in the range 445°C to 475°C.

7. The process of claim 2 wherein the dehydrogenation reactor is a reforming reactor system, wherein the first reaction temperature is lower than the temperature of the second set of the reaction conditions.

8. The process of claim 3 further comprising passing the raffinate stream to the reforming reactor system.

9. The process of claim 3 further comprising passing the raffinate stream to the dehydrogenation reactor system.