Claims:

1. A method for making a higher-octane fuel component from a feed stream containing C8+ paraffins, comprising:

catalytically cracking C8+ paraffins in the feed stream using a metal-impregnated Zeolite catalyst under operating conditions substantially converting the C8+ paraffins in the feed stream to C_{5-7} paraffins and olefins and C_4-paraffins and olefins converted from the C8+ paraffins,

the C_{5-7} olefins and the C_{4-} olefins being hydrogenated in the presence of the metal-impregnated Zeolite catalyst to form second C_{5-7} paraffins and second C_{4-} paraffins, respectively,

the reaction product comprising a liquid phase containing first and second C_{5-7} paraffins and a gas phase containing first and second C_{4-} paraffins;

the liquid phase paraffins having an Octane Value that is at least 1 Octane Value higher than the Octane Value of the paraffins in the feed stream; and

separating the liquid phase from the gas phase.

2. The method of claim 1 in which the metal-impregnated zeolite catalyst is a hydrogenation-metal-impregnated catalyst converting the olefins to paraffins.

3. The method of claim 1 in which the liquid phase further comprises C8+ paraffins.

4. The method of claim 3 and which further includes using the liquid phase as a fuel component.

5. The method of claim 4 in which the feed stream includes C5-13 n-paraffins, the method further comprising separating out a portion of the C5-13 n-paraffins are separated out for use as a fuel component.

6. The method of claim 1, in which the catalytic cracking is performed under the operating conditions include a temperature below 370°C, a pressure below 250 psig, and a flow rate of 1.5 to about 3 WHSV.

7. The method of claim 6 in which the C8+ paraffins comprise C8-13 paraffins.

8. The method of claim 7 in which the C8+ paraffins comprise C8-13 n-paraffins.

9. The method of claim 8 in which the catalytic cracking is performed under conditions to substantially crack the C8-13 n-paraffins.

10. The method of claim 9 in which the feed stream further includes aromatic hydrocarbons.

11. The method of claim 10 in which the feed stream includes aromatics and the catalytic cracking is performed under operating conditions in which less than 5% of the aromatics are saturated.

12. The method of claim 6 in which the feed stream comprises an output stream downstream of a catalytic reformer or a catalytic cracker.

13. The method of claim 12 in which the feed stream comprises a complete reformate stream.

14. The method of claim 12 which further includes addition of hydrogen to the feed stream prior to the catalytic cracking.

15. The method of claim 14 in which the metal-impregnated zeolite catalyst is a hydrogenation-metal-impregnated catalyst converting the olefins to paraffins.

16. The method of claim 12 in which the catalytic cracking is performed without hydrogen other than that present in the output stream to reduce conversion of alkyl-aromatics to benzene and/or reduce coking.

17. The method of claim 12 which further comprises pretreating the feed stream prior to catalytic cracking, the pretreating being selected from the group consisting of thermal separation, slit stream, distillation and sulfur-reduction.

18. The method of claim 17 in which the pretreating is selected from the group consisting of thermal separation to provide a feed stream cut at any targeted point including above 95 °C, thermal separation to provide a feed stream cut above 115 °C, thermal separation to provide a feedstream cut above 140 °C, thermal separation to provide a feedstream cut above 159°C.

19. A method for making a higher-octane fuel component from a feed stream containing C8+ paraffins, comprising:

catalytically cracking C8+ paraffins in the feed stream using a metal-impregnated zeolite catalyst and operating under conditions converting the C8+ paraffins in the feed stream to a reaction product comprising C_{5-7} paraffins and C_{4-} paraffins converted from the C8+ paraffins, the paraffins being converted in a two-step process,

the C8+ paraffins first being converted to a combination of first C4- paraffins and first C5-7 olefins,

the C4- and C5-7 olefins being hydrogenated in the presence of the metal-impregnated zeolite catalyst to form second C4- paraffins and second C5-7 paraffins,

the reaction product comprising a liquid phase effluent containing the first and second C5-7 paraffins and a gas phase effluent containing the first and second C4- paraffins;

the liquid phase effluent having an Octane Value that is at least 1 Octane Value higher than the Octane Value of the feed stream; and

separating the liquid phase effluent from the gas phase effluent.

20. The method of claim 19 in which the Octane Value of the liquid phase effluent is at least 3 more than the Octane Value of the feed stream.

21. The method of claim 20 which further includes addition of hydrogen to the feed stream prior to the catalytic cracking.

22. The method of claim 21 in which the C8+ paraffins comprise C8-13 n-paraffins, and the catalytic cracking is performed under conditions to substantially crack the C8-13 n-paraffins.