

CLAIMS:

1. A process for upgrading paraffins and olefins, the process comprising:
 - (i) contacting a first feed comprising C₁₄- olefins with an oligomerization catalyst in a first reaction zone under conditions effective for oligomerization of olefins to higher molecular weight hydrocarbons;
 - (ii) removing deactivated catalyst from the first reaction zone at a first temperature;
 - (iii) contacting the deactivated catalyst with an oxygen-containing gas and with a hydrocarbon-containing fuel in a regeneration zone to regenerate the catalyst and raise the temperature of the catalyst to a second, higher temperature;
 - (iv) contacting a second feed comprising C₁₄- paraffins with the regenerated catalyst in a second reaction zone to convert at least some of the paraffins in the second feed to a reaction effluent comprising olefins, aromatic hydrocarbons and regenerated catalyst; and
 - (v) supplying the reaction effluent to the first reaction zone.
2. The process of claim 1 wherein the first reaction zone comprises a fluidized catalyst bed or a riser reactor.
3. The process of claim 1 or 2, wherein the second reaction zone comprises a transfer line for supplying the second feed to the first reaction zone.
4. The process of any one of claims 1-3, in which the contacting (i) is performed at a temperature from 600 to 900°F (316 to 482°C).
5. The process of any one of claims 1-4, in which the contacting (i) is performed at a pressure of from 20-400 psig (240 to 2860 kPa-a).
6. The process of any one of claims 1-5, in which the contacting (iii) is performed at a temperature from 1200 to 1450°F (648 to 788°C).
7. The process of any one of claims 1-6, in which the contacting (iv) is performed at a temperature from 950-1250°F (510 to 677°C).
8. The process of any one of claims 1-7, in which the oligomerization catalyst comprises a molecular sieve.
9. The process of any one of claims 1-8, in which the oligomerization catalyst comprises a molecular sieve having a Constraint Index of 1 to 12.
10. The process of any one of claims 1-9, in which the first feed comprises FCC fuel gas and the second feed comprises C₃ to C₅ paraffins.
11. The process of any one of claims 1-10, in which the contacting (i) also effects alkylation of aromatics in the reaction effluent with olefins in the first feed and/or olefins in the reaction effluent.

12. The process of any one of claims 1-11, further comprising withdrawing a product stream from the first reaction zone.
13. The process of any one of claims 1-12, in which the product stream comprises gasoline and/or distillate boiling range hydrocarbons.
14. The process of any one of claims 1-13, in which the product stream contains at least 30 weight % less benzene than the reaction effluent.
15. The process of any one of claims 1-14, in which the fuel comprises one or both of liquid petroleum gas (LPG) or C₂-hydrocarbon gas recovered from a product stream withdrawn from the first reaction zone.
16. The process of any one of claims 1-16, in which the weight ratio of the amount of C₁₄-olefins in the first feed to the amount of C₁₄-paraffins in the second feed is at least 1:1.
17. A system for upgrading paraffins and olefins comprising:
 - an oligomerization reactor containing a fluidized catalyst and configured with separate inlets to receive a converted paraffin feed stream comprising regenerated catalyst and a fresh olefin feed stream and further configured with separate outlets for a product stream and a spent catalyst stream;
 - a catalyst regenerator configured with an inlet to receive a spent catalyst stream from the oligomerization reactor, an inlet for an oxidant gas, and an inlet for receiving a fuel and configured with an outlet for a regenerated catalyst stream; and
 - a mixing zone configured to combine a fresh paraffinic feed stream with the regenerated catalyst stream and having an outlet for a converted paraffin feed stream; and
 - a transfer line connecting the mixing zone to the converted paraffin feed stream inlet of the oligomerization reactor.
18. The system of claim 17, that further comprises a recovery unit operably connected to the oligomerization reactor for receiving the product stream, the recovery unit configured to separate and recover a C₅₊-hydrocarbon product, a liquified petroleum gas (LPG) product, and a C₂-hydrocarbon gas product.
19. The system of claim 18, that further comprises a transport line to recycle one or more of LPG or C₂-hydrocarbons from the recovery unit to the fuel inlet of the catalyst regenerator.
20. A C₅₊-hydrocarbon product produced by integrating a process of oligomerizing an olefinic feed under a first set of conditions and a process of dehydrocyclizing a paraffinic feed under a second set of conditions, the product containing less benzene than would be produced by dehydrocyclizing the paraffinic feed alone under the second set of conditions.

21. The C₅₊ hydrocarbon product of claim 20 that contains at least 30 weight % less benzene than would be produced by dehydrocyclizing the paraffinic feed alone under the second set of conditions.
22. The C₅₊ hydrocarbon product of claim 21 that contains less than 1 wt.% benzene.