CLAIMS

1. A process for producing petrochemical products from a hydrocarbon material, the process comprising:

separating the hydrocarbon material into a lesser boiling point fraction and a greater boiling point fraction;

cracking at least a portion of the greater boiling point fraction in the presence of a first catalyst at a reaction temperature of from 500 ºC to 700 ºC to produce a first cracking reaction product and a spent first catalyst;

cracking at least a portion of the lesser boiling point fraction in the presence of a second catalyst at a reaction temperature of from 500 ºC to 700 ºC to produce a second cracking reaction product and a spent second catalyst;

separating at least a portion of the first cracking reaction product from the spent first catalyst;

separating at least a portion of the second cracking reaction product from the spent second catalyst;

regenerating at least a portion of the spent first catalyst to produce a regenerated first catalyst;

maintaining the spent second catalyst separate from the spent first catalyst;

transferring heat from regeneration of the spent first catalyst to the spent second catalyst;

regenerating at least a portion of the spent second catalyst to produce a regenerated second catalyst; and

recovering the first cracking reaction product and the second cracking reaction product.

2. The process of claim 1 further comprising contacting the spent second catalyst with a flue gas from regeneration of the first spent catalyst.

3. The process of either one of claims 1 or 2 where the hydrocarbon material comprises at least one of a crude oil, vacuum residue, tar sands, bitumen, atmospheric residue, vacuum gas oils, demetalized oils, naphtha, or combinations of these.

4. A process for operating a hydrocarbon feed conversion system having a first fluidic catalytic cracking (FCC) unit and a second FCC unit for producing petrochemical products from a hydrocarbon feed stream, the process comprising:

introducing the hydrocarbon feed stream to a feed separator;

separating the hydrocarbon feed stream into a lesser boiling point fraction and a greater boiling point fraction in the feed separator;

passing the greater boiling point fraction to the first FCC unit;

passing the lesser boiling point fraction to the second FCC unit;

cracking at least a portion of the greater boiling point fraction in first FCC unit in the presence of a first catalyst at a reaction temperature of from 500 ºC to 700 ºC to produce a first cracking reaction product and a spent first catalyst;

cracking at least a portion of the lesser boiling point fraction in the second FCC unit in the presence of a second catalyst and at a reaction temperature of from 500 ºC to 700 ºC to produce a second cracking reaction product and a spent second catalyst;

passing the spent first catalyst to a first regeneration zone;

regenerating at least a portion of the spent first catalyst in the first regeneration zone to produce a regenerated first catalyst;

passing the spent second catalyst to a second regeneration zone separate from the first regeneration zone;

regenerating at least a portion of the spent second catalyst in the second regeneration zone to produce a regenerated second catalyst;

transferring heat from the first regeneration zone to the second regeneration zone;

recycling the regenerated first catalyst to the first FCC unit and the regenerated second catalyst to the second FCC unit; and

recovering the first cracking reaction product and the second cracking reaction product.

5. The process of claim 4 further comprising:

passing a flue gas stream from the first regeneration zone to the second regeneration zone; and

contacting the spent second catalyst in the second regeneration zone with the flue gas stream.

6. The process of either one of claims 4 or 5 further comprising maintaining the spent first catalyst in the first regeneration zone separate from the spent second catalyst in the second regeneration zone.

7. The process of any one of claims 4 through 6 where the second regeneration zone is separated from the first regeneration zone by a porous separation zone.

8. The process of any one of claims 4 through 7 where the first regeneration zone and the second regeneration zone are disposed within a single regenerator.

9. The process of any one of claims 4 through 8 further comprising:

separating at least a portion of the first cracking reaction product from the spent first catalyst in a first separating zone before passing the spent first catalyst to the first regeneration zone; and

separating at least a portion of the second cracking reaction product from the spent second catalyst in a second separating zone before passing the spent second catalyst to the second regeneration zone.

10. The process of any one of claims 4 through 9 further comprising:

passing the regenerated first catalyst from the first regeneration zone to a first catalyst feed hopper; and

passing the regenerated second catalyst from the second regeneration zone to a second catalyst feed hopper.

11. The process of any one of the preceding claims further comprising:

recycling the regenerated first catalyst back into contact with the greater boiling point fraction; and

recycling the regenerated second catalyst back into contact with the lesser boiling point fraction.

12. The process of any one of the preceding claims where the first catalyst is different than the second catalyst.

13. The process of any one of the preceding claims where the first cracking reaction product or the second cracking reaction product comprises at least one of ethylene, propene, butene, or pentene.

14. A system for producing at least one petrochemical product from a hydrocarbon material, the system comprising:

a first cracking reaction zone;

a first separation zone downstream of the first cracking reaction zone;

a first regeneration zone downstream of the first separation zone;

a second cracking reaction zone in parallel with the first cracking reaction zone;

a second separation zone downstream of the second cracking reaction zone;

a second regeneration zone downstream of the second separation zone, where the second regeneration zone is physically separated from the first regeneration zone; and

a flue gas flow path extending from the first regeneration zone to the second regeneration zone, the flue gas flow path comprising a particulate barrier for preventing a transfer of one or more spent catalysts between the first regeneration zone and the second regeneration zone.

15. The system of claim 14 further comprising a feed separator having an inlet, a greater boiling point fraction outlet stream, and a lesser boiling point fraction outlet stream, where the greater boiling point fraction outlet stream is fluidly coupled to the first cracking reaction zone and the lesser boiling point fraction outlet stream is fluidly couple to the second cracking reaction zone.