CLAIMS:

1. A catalyst bed platform structure, comprising:

a catalyst bed platform;

a support pipe supporting the bottom of the catalyst bed platform, a central axis of the pipe being approximately aligned with a geometric center of the catalyst bed platform;

a flow distributor separated from the catalyst bed platform by a gap, the support pipe passing through the flow distributor and attached to the flow distributor to provide support for the flow distributor; and

a pipe support structure supporting the bottom of the support pipe, the pipe support structure being adapted to reside on a bottom surface of an existing reactor having walls and a top opening;

wherein the catalyst bed platform is formed from components capable of passing into the existing reactor through the top opening, which has a diameter of about 28 inches or less, without welding the catalyst bed platform to a structural portion of the reactor walls.

2. The catalyst bed platform structure of claim 1, wherein the pipe support structure comprises a collector structure and/or a plurality of support legs.

3. The catalyst bed platform structure of any one of the previous claims, wherein the catalyst bed platform comprises: a plurality of catalyst support beams extending radially from the support pipe, the plurality of catalyst support beams including a ring groove; and a ring support seated in the ring groove, at least a top portion of the support pipe passing through an inner opening of the ring, the ring support connecting the catalyst support beams to the support pipe in a cantilevered manner.

4. The catalyst bed platform structure of any one of the previous claims, wherein the catalyst bed platform further comprises a catalyst support grid, the catalyst support grid having a mesh size suitable for supporting catalyst particles, and a platform skirt forming an outer diameter surface for the catalyst platform.

5. A catalyst bed platform structure, comprising:

a collector structure;

a support pipe supported by the collector structure;

a plurality of catalyst support beams extending radially from the support pipe, the plurality of catalyst support beams including a ring groove;

a ring support seated in the ring groove, at least a top portion of the support pipe passing through an inner opening of the ring, the ring support connecting the catalyst support beams to the support pipe in a cantilevered manner;

a catalyst support grid supported by the catalyst support beams; and

a platform skirt forming an outer diameter surface for the catalyst platform.

6. The catalyst bed platform structure of claim 5, further comprising a flow distributor located below the plurality of catalyst support beams, the flow distributor being at least partially supported by the support pipe and/or by beams supported by the support pipe.

7. The catalyst bed platform structure of any one of the previous claims, wherein an interior volume of the support pipe comprises a catalyst dumping tube, the catalyst bed platform having an opening above the interior volume of the support pipe for communication of catalyst particles from a

volume above the catalyst bed platform to the interior volume of the support pipe.

8. The catalyst bed platform structure of claim 7, further comprising:

a lower catalyst bed, the collector and at least a portion of the support pipe being within the lower catalyst bed; and

an upper catalyst bed supported by the catalyst support grid;

wherein the support pipe comprises a catalyst dumping tube filled with inert catalyst, the exit for the catalyst dumping tube being below a top level of the lower catalyst bed.

9. The catalyst bed platform structure of any one of claims 4-8, further comprising a fill material supported between the platform skirt and an inner wall of a reactor.

10. The catalyst bed platform structure of any one of the previous claims, wherein the catalyst bed platform structure is formed from pieces that can pass through an opening having a diameter of about 28 inches or less, for example about 26 inches or less or about 24 inches or less.

11. The catalyst bed platform structure of any one of claims 3 or 5-10, wherein the ring support comprises a plurality of ring support pieces, the ring support pieces being joined by a radial weld after seating the ring support pieces in the ring groove.

12. A method for dividing a catalyst bed in a reactor without welding a catalyst bed platform to a structural portion of the reactor walls, comprising:

passing a plurality of catalyst bed platform components into a reactor through an opening having a diameter of about 28 inches or less, for

example about 26 inches or less or about 24 inches or less, the reactor having a first catalyst bed volume;

constructing a catalyst bed platform within the reactor using the catalyst bed platform components;

supporting the constructed catalyst bed platform with a support pipe, the length of the support pipe corresponding to a height for the catalyst bed platform within the reactor;

wherein the catalyst bed platform divides the first catalyst bed volume into an upper catalyst bed volume and a lower catalyst bed volume, at least one of the upper catalyst bed volume and the lower catalyst bed volume having a length to diameter ratio of about 4:1 or less.

13. The method of claim 12, wherein the first catalyst bed volume has a length to diameter ratio of at least about 6:1, and at least one of the upper catalyst bed volume and the lower catalyst bed volume has a length to diameter ratio of about 2.5:1 or less.

14. The method of any one of claims 12-13, wherein supporting the constructed catalyst bed platform comprises supporting the constructed catalyst bed platform without the catalyst bed platform contacting an inner wall of the reactor so that a gap is formed between the catalyst bed platform and the inner wall of the reactor, the method further comprising inserting a fill material in the gap.

CLAIMS:

1. A catalyst bed platform structure, comprising:

a catalyst bed platform;

a support pipe supporting the bottom of the catalyst bed platform, a central axis of the pipe being approximately aligned with a geometric center of the catalyst bed platform, wherein an interior volume of the support pipe comprises a catalyst dumping tube;

a flow distributor separated from the catalyst bed platform by a gap, the support pipe passing through the flow distributor and attached to the flow distributor to provide support for the flow distributor; and

a pipe support structure supporting the bottom of the support pipe, the pipe support structure being adapted to reside on a bottom surface of an existing reactor having walls and a top opening;

wherein the catalyst bed platform is formed from components capable of passing into the existing reactor through the top opening, which has a diameter of about 28 inches or less, without welding the catalyst bed platform to a structural portion of the reactor walls; and

wherein the catalyst bed platform has an opening above the interior volume of the support pipe for communication of catalyst particles from a volume above the catalyst bed platform to the interior volume of the support pipe.

2. The catalyst bed platform structure of claim 1, wherein the pipe support structure comprises a collector structure.

3. The catalyst bed platform structure of claim 1, wherein the pipe support structure comprises a plurality of support legs.

4. The catalyst bed platform structure of claim 1, wherein the catalyst bed platform comprises:

a plurality of catalyst support beams extending radially from the support pipe, the plurality of catalyst support beams including a ring groove; and

a ring support seated in the ring groove, at least a top portion of the support pipe passing through an inner opening of the ring, the ring support connecting the catalyst support beams to the support pipe in a cantilevered manner.

5. The catalyst bed platform structure of claim 1, wherein the catalyst bed platform further comprises a catalyst support grid, the catalyst support grid having a mesh size suitable for supporting catalyst particles.

6. The catalyst bed platform structure of claim 1, wherein the catalyst bed platform structure is formed from pieces that can pass through an opening having a diameter of about 24 inches or less.

7. A catalyst bed platform structure, comprising:

a collector structure;

a support pipe supported by the collector structure;

a plurality of catalyst support beams extending radially from the support pipe, the plurality of catalyst support beams including a ring groove;

a ring support seated in the ring groove, at least a top portion of the support pipe passing through an inner opening of the ring, the ring support connecting the catalyst support beams to the support pipe in a cantilevered manner;

a catalyst support grid supported by the catalyst support beams; and

a platform skirt forming an outer diameter surface for the catalyst platform.

8. The catalyst bed platform structure of claim 7, further comprising one or more catalyst dumping tubes.

9. The catalyst bed platform structure of claim 8, wherein a catalyst dumping tube is formed from the interior of the support pipe, the catalyst support grid having an opening above the support pipe to allow for passage of catalyst particles from the catalyst support grid to the catalyst dumping tube.

10. The catalyst bed platform structure of claim 7, further comprising a fill material supported between the platform skirt and an inner wall of a reactor.

11. The catalyst bed platform structure of claim 7, wherein the catalyst bed platform structure is formed from pieces that can pass through an opening having a diameter of about 24 inches or less.

12. The catalyst bed platform structure of claim 7, further comprising a flow distributor located below the plurality of catalyst support beams, the flow distributor being at least partially supported by the support pipe and/or by beams supported by the support pipe.

13. The catalyst bed platform structure of claim 7, wherein the ring support comprises a plurality of ring support pieces, the ring support pieces being joined by a radial weld after seating the ring support pieces in the ring groove.

14. The catalyst bed platform structure of claim 7, further comprising:

a lower catalyst bed, the collector and at least a portion of the support pipe being within the lower catalyst bed; and

an upper catalyst bed supported by the catalyst support grid.

15. The catalyst bed platform structure of claim 14, wherein the support pipe comprises a catalyst dumping tube filled with inert catalyst, the exit for the catalyst dumping tube being below a top level of the lower catalyst bed.

16. A catalyst bed platform structure, comprising:

a catalyst bed platform;

a support pipe supporting the bottom of the catalyst bed platform, a central axis of the pipe being approximately aligned with a geometric center of the catalyst bed platform;

a flow distributor separated from the catalyst bed platform by a gap, the support pipe passing through the flow distributor and attached to the flow distributor to provide support for the flow distributor;

a pipe support structure supporting the bottom of the support pipe, the pipe support structure being adapted to reside on a bottom surface of an existing reactor having walls and a top opening;

a plurality of catalyst support beams extending radially from the support pipe, the plurality of catalyst support beams including a ring groove; and

a ring support seated in the ring groove, at least a top portion of the support pipe passing through an inner opening of the ring, the ring support connecting the catalyst support beams to the support pipe in a cantilevered manner;

wherein the catalyst bed platform is formed from components capable of passing into the existing reactor through the top opening, which has a diameter of about 28 inches or less, without welding the catalyst bed platform to a structural portion of the reactor walls.