CLAIMS:

1. A desalting process, the process comprising:

providing a hydrocarbon feed comprising heavy hydrocarbon;

pressurizing the hydrocarbon feed to produce a pressurized hydrocarbon feed;

heating the pressurized hydrocarbon feed in one or more heat exchangers producing a heated hydrocarbon feed;

mixing the heated hydrocarbon feed with water and separating an inter-stage hydrocarbon feed from inter-stage water;

mixing the inter-stage hydrocarbon feed with water and separating a desalted hydrocarbon feed from outlet water; dividing the desalted hydrocarbon stream into at least first and second portions;

pyrolysing at least part of the first portion of the desalted hydrocarbon feed in a steam cracker; and

combining at least part of the second portion of the desalted hydrocarbon feed with at least a portion of the hydrocarbon feed.

2. The process of claim 1, wherein the pressurization includes pressurizing the hydrocarbon feed in at least one pump to a pressure of from about 101 kPa (abs) to about 2000 kPa (abs).

3. The process of any of claims 1 to 2, wherein heating comprises heating the pressurized hydrocarbon feed to a temperature from about 100°C to about 150°C.

4. The process of any of claims 1 to 3, further comprising storing at least a portion of the desalted hydrocarbon feed in a surge drum.

5. The process of any of claims 1 to 4, wherein 1 wt. % to 50 wt. % of the desalted hydrocarbon feed resides in the second portion, and wherein the second portion is combined with the hydrocarbon feed in at least one storage tank.

6. The process of any of claims 1 to 5, wherein the pyrolysis is performed at a temperature from about 760°C to about 1100°C, and wherein the first portion contains ≤ 4 wppm of salt.

7. The process of any of claims 1 to 6, further comprising a pyrolysis pressure from about 60 kPa (gauge) to about 500 kPa (gauge).

8. An apparatus for removing contaminants from a hydrocarbon feed containing heavy hydrocarbons, the apparatus comprising:

a first desalter;

a second desalter in fluid connection with the first desalter;

a steam cracker in fluid connection with the second desalter,

a storage tank in fluid connection with the first desalter, and

a hydrocarbon recycle line in fluid connection with the second desalter and the storage tank.

9. The apparatus of claim 8, further comprising, a vapor-liquid separator fluidically and thermally integrated with the steam cracker, and wherein the first and/or second desalters utilize water injection for the desalting.

10. The apparatus of any of claims 8 to 9, further comprising a surge drum in fluid connection with the second desalter and the steam cracker.

11. The apparatus of any of claims 9 to 10, further comprising a third desalter situated between the second desalter and the steam cracker and in fluidic communication with the second desalter and the steam cracker.

12. The apparatus of any of claims 8 to 11, further comprising a recycle line in fluid connection with the steam cracker and the first desalter.

13. The apparatus of claim 12, further comprising a recycle line in fluid connection with the steam cracker and the storage tank.

14. The apparatus of any of claims 11 to 13, further comprising a recycle line in fluid connection with the steam cracker and the hydrocarbon recycle line.

15. An apparatus for removing contaminants from a hydrocarbon feed containing heavy hydrocarbons, the apparatus comprising:

a desalter having an established electric field;

a storage tank in fluid connection with the desalter;

a hydrocarbon recycle line in fluid connection with the desalter and the storage tank; and

a steam cracker in fluid connection with the desalter.

16. The apparatus of claim 15, further comprising a surge drum in fluid connection with the desalter and the steam cracker.

17. The apparatus of any of claims 15 to 16, further comprising a recycle line in fluid connection with the steam cracker and the storage tank.

18. The apparatus of any of claims 15 to 17, further comprising a recycle line in fluid connection with the steam cracker and the desalter.

19. The apparatus of any of claims 15 to 18, further comprising a recycle line in fluid connection with the steam cracker and the hydrocarbon recycle line.

20. An apparatus for removing contaminants from a hydrocarbon feed containing heavy hydrocarbons, the apparatus comprising:

a surge drum;

a desalter in fluid having an established electric field, the desalter being in fluidic connection with the surge drum; a storage tank in fluid connection with the desalter;

a hydrocarbon recycle line in fluid connection with the desalter and the storage tank; and

a steam cracker in fluidic connection with the surge drum.

21. The apparatus of claim 20, further comprising a first pump in fluid connection with the storage tank and the desalter, and a stand-by auto-starting pump in fluid connection with the storage tank and the desalter.

22. The apparatus of any of claims 20 to 21, further comprising a recycle line in fluid connection with the steam cracker and the storage tank.

23. The apparatus of any of claims 20 to 22, further comprising a recycle line in fluid connection with the steam cracker and the desalter.

24. An apparatus for removing contaminants from a hydrocarbon feed containing heavy hydrocarbons, the apparatus comprising:

a storage tank in fluid connection with a first desalter;

a second desalter in fluid connection with the first desalter;

a first hydrocarbon recycle line in fluid connection with the second desalter and the storage tank;

a steam cracker in fluid connection with the second desalter;

a surge drum in fluid connection with the second desalter and the steam cracker; and

a purification system in fluid connection with the steam cracker.

25. The apparatus of claim 24, wherein the apparatus further comprises a recycle line in fluid connection with the purification system and the first desalter.

28. A process for producing light hydrocarbons from a hydrocarbon feed containing heavy hydrocarbons, the process comprising:

pressurizing the hydrocarbon feed to produce a pressurized hydrocarbon feed;

heating the pressurized hydrocarbon feed in one or more heat exchangers producing a heated hydrocarbon feed;

mixing the heated hydrocarbon feed with water to produce an emulsion,

separating from the emulsion at least a desalted hydrocarbon feed;

storing at least a portion of the desalted hydrocarbon feed in one or more surge drums,

recycling at least a portion of the desalted hydrocarbon feed to a location upstream of the mixing, and

pyrolysing in at least one steam cracking furnace at least a portion of the desalted hydrocarbon feed and/or at least a portion of the stored desalted hydrocarbon feed.

27. A process for producing light hydrocarbons from a hydrocarbon feed containing heavy hydrocarbons, the process comprising:

pressurizing the hydrocarbon feed to produce a pressurized hydrocarbon feed;

heating the pressurized hydrocarbon feed in one or more heat exchangers producing a heated hydrocarbon feed;

mixing the heated hydrocarbon feed with water to produce an emulsion,

separating from the emulsion at least a desalted hydrocarbon feed;

recycling at least a portion of the desalted hydrocarbon feed to a location upstream of the mixing, and

pyrolysing in at least one steam cracking furnace at least a portion of the desalted hydrocarbon feed.