What is claimed is:

1. A method of processing a hydrocarbon-bearing source material, the method comprising:

passing the hydrocarbon-bearing source material though an apparatus at a pressure within a range of about 70 psi to about 125 psi, the apparatus including:

an inflow portion for receiving the hydrocarbon-bearing source material,

a treatment portion for treating the hydrocarbon-bearing source material, wherein the treatment portion includes a molybdenum-containing structure made of a corrosion-resistant alloy including molybdenum, wherein the treatment portion further includes at least two contact surface planes separated by cavitation spaces, and

an outflow portion for outputting a hydrocarbon-bearing processed material;

taking the processed material from the output.

2. The method of claim 1, wherein the hydrocarbon-bearing source material comprises an oil-in- water emulsion, and wherein the hydrocarbon-bearing processed material comprises separate aqueous and oil phases.

3. The method of claim 2 further comprising pyrolyzing the oil-in-water emulsion to obtain a derivative and passing the derivative through the apparatus.

4. The method of claim 2, wherein the oil-in-water emulsion comprises oily wastewater, a petroleum feedstock, or a part of a secondary oil recovery system.

5. The method of claim 1 performed without the addition of a flocculant.

6. The method of claim 1, further comprising an endothermic electrochemical oxidative reaction occurring when the hydrocarbon-bearing source material contacts the molybdenum-containing structure which results in cooling of the hydrocarbon-bearing source material.

7. The method of claim 1, wherein the hydrocarbon-bearing source material comprises a liquid solution or emulsion containing oil, and wherein the hydrocarbon-bearing processed material has a lower viscosity than the hydrocarbon-bearing source material.

8. A system to process a hydrocarbon-bearing source material, the system comprising:

a machine to pressurize the hydrocarbon-bearing source material; and

an apparatus comprising:

a housing having an inflow portion connected to the machine to receive the hydrocarbon-bearing source material at a pressure of within a range of about 70 psi to about 125 psi;

a treatment portion for treating the hydrocarbon-bearing source material, wherein the treatment portion includes a molybdenum-containing structure made of a corrosion-resistant alloy including molybdenum, wherein the treatment portion further includes at least two contact surface planes separated by cavitation spaces; and

an outflow portion to output a hydrocarbon-bearing processed material.

9. The system of claim 8, wherein the hydrocarbon-bearing source material comprises an oil-in-water emulsion, and wherein the hydrocarbon-bearing processed material comprises separate aqueous and oil phases.

10. The system of claim 8, wherein the molybdenum-containing structure is machined or polished to remove scale from a casting process.

11. The system of claim 8, wherein the molybdenum-containing structure comprises at least two disc-like elements are mounted on a shaft extending axially through the housing, the disc-like elements being separated by a distance, each disc-like element having a first wall facing the inflow portion, a second wall facing the outflow portion and a peripheral wall extending between the first and second walls, the disc-like elements being mounted on a shaft, wherein the disc-like element comprises any geometric shape, wherein the distance between the disc-like elements provides for a cavitation space.

12. The system of claim 11, wherein the contact surface plane forms a surface on the disc-like elements which is machined or polished to remove scale from a casting process.

13. The system of claim 11, wherein the disc-like elements are made of a metal alloy comprising about 1.0 wt. % or more molybdenum, about 1.5 wt. % or more molybdenum, from about 3.0 wt. % to about 4.0 wt. % molybdenum, from about 4.0 wt. % to about 4.5 wt. % molybdenum, from about 4.0 wt. % to about 5.0 wt. % molybdenum, from about 5.0 wt. % to about 6.0 wt. % molybdenum, from about 6.0 wt. % to about 7.0 wt. % molybdenum, from about 7.0 wt. % to about 8.0 wt. % molybdenum, from about 8.0 wt. % to about 9.0 wt. % molybdenum, from about 9.0 wt. % to about 10.0 wt. % molybdenum, from about 10.0 wt. % to about 15.0 wt. % molybdenum, from about 15.0 wt. % to about 20.0 wt. % molybdenum, from about 20.0 wt. % to about 25.0 wt. % molybdenum, from about 25.0 wt. % to about 30.0 wt. % molybdenum, from about 30.0 wt. % to about 35.0 wt. % molybdenum, from about 35.0 wt. % to about 40.0 wt. % molybdenum, from about 0.5 wt. % to about 40.0 wt. % molybdenum, or up to about 40 wt. % molybdenum.

14. The system of claim 13, wherein the metal alloy of the disc-like elements further comprise about 5.0 wt. % or more nickel, about 10.0 wt. % or more nickel, about 15.0 wt. % or more nickel, about 20.0 wt. % or more nickel, about 25.0 wt. % or more nickel, from about 5.0 wt. % to about 10.0 wt. % nickel, from about 10.0 wt. % to about 15.0 wt. % nickel, from about 15.0 wt. % to about 20.0 wt. % nickel, or from about 20.0 wt. % to about 25.0 wt. % nickel.

15. The system of claim 14, wherein the metal alloy is 316L stainless steel, 317L stainless steel, or 904L stainless steel.

16. The system of claim 11, wherein a surface of the disc-like elements is free of dielectric contaminants.

17. The system of claim 11, wherein the disc-like elements are machined or polished with a non-ionic sanding grit which contains no metal contaminants.

18. The system of claim 11, wherein the at least one edge within the disc-like elements is water jet cut.

19. The system of claim 11, wherein apparatus includes between 2 and 30 disc-like elements.

20. The system of claim 8, wherein the hydrocarbon-bearing source material comprises a liquid solution or emulsion containing oil, and wherein the hydrocarbon-bearing processed material has a lower viscosity than the hydrocarbon-bearing source material.