additional embodiments, the methods further include settling the petroleum oil and/or hydrocarbon feedstock in a tank to enable the water, peroxyacid composition and particulates to settle on the bottom thereof from the petroleum oil and/or hydrocarbon feedstock. In embodiments, the petroleum oil and/or hydrocarbon feedstock is a produced crude oil and is obtained from a pipeline that directs a flow of produced crude oil. In embodiments, the petroleum oil and/or hydrocarbon feedstock once separated from the water phase does not contain any peroxyacid composition. In embodiments, the petroleum oil and/or hydrocarbon feedstock comprise petroleum oil, crude oil, slop oil, and other hydrocarbon streams from a refinery application. In any of the embodiments, the method can exclude the use of phosphoric or phosphorus acids. In an embodiment, a crude oil emulsion treatment consists of: crude oil; a peroxyacid composition for transferring metals and particulates from a hydrocarbon phase to a water phase; and a source of water. In embodiments, the treated crude oil emulsion further comprises at least one additional component that is a solvent, a corrosion inhibitor, an emulsion breaker or demulsifier, a scale inhibitor, metal chelant, and/or wetting agents.

In one aspect, there is provided a method for removing particulates in petroleum oil and/or hydrocarbon feedstocks which comprises the steps of mixing petroleum oil and/or hydrocarbon feedstock with water to form an emulsion comprising a hydrocarbon phase and a water phase; adding a peroxyacid composition to the emulsion, wherein the peroxyacid causes the particulates to move from the hydrocarbon phase into the water phase; and separating the hydrocarbon phase from the water phase to remove the iron and other particulates and the peroxyacid composition from the emulsion; wherein the particulates are metal or organometallic complexes comprising one or more of zinc, nickel, vanadium, aluminum, barium, chromium, cobalt, copper, magnesium, manganese, molybdenum, strontium, titanium, sodium, potassium, calcium, silicon, chloride, sulfur, oxide, and sulfide.

In another aspect, there is provided a treated crude oil emulsion consisting of crude oil; a peroxyacid composition for transferring metals and particulates from a hydrocarbon phase to a water phase; and a source of water.

In yet another aspect, there is provided a treated emulsion consisting of: petroleum oil, crude oil, slop oil, or another hydrocarbon stream in a refinery application; a peroxyacid composition for transferring metals and particulates from a hydrocarbon phase to a water phase; and a source of water.

In an embodiment, an emulsion treatment consists of: petroleum oil, crude oil, slop oil, or another hydrocarbon stream in a refinery application; a peroxyacid composition for transferring metals and particulates from a hydrocarbon phase to a water phase; and a source of water. In embodiments, the treated emulsion further comprises at least one

additional component that is a solvent, a corrosion inhibitor, an emulsion breaker or demulsifier, a scale inhibitor, metal chelant, and/or wetting agents.

While multiple embodiments are disclosed, still other embodiments of the present invention will become apparent to those skilled in the art from the following detailed description, which shows and describes illustrative embodiments of the invention. Accordingly, the detailed description and its Examples are to be regarded as illustrative in nature and not restrictive.

What is claimed is:

1. A method for removing particulates in petroleum oil and/or hydrocarbon feedstocks which comprises the steps of:

mixing petroleum oil and/or hydrocarbon feedstock with water to form an emulsion comprising a hydrocarbon phase and a water phase;

adding a peroxyacid composition to the emulsion, wherein the peroxyacid causes the particulates to move from the hydrocarbon phase into the water phase; and

separating the hydrocarbon phase from the water phase to remove the particulates and the peroxyacid composition from the emulsion;

wherein the particulates are metal or organometallic complexes comprising one or more of zinc, nickel, vanadium, aluminum, barium, chromium, cobalt, copper, magnesium, manganese, molybdenum, strontium, titanium, sodium, potassium, calcium, silicon, chloride, sulfur, oxide, and sulfide.

2. The method of claim 1, wherein the peroxyacid oxidizes and chelates the particulates in the emulsion.

3. The method of any one of claims 1-2, wherein the particulates comprise iron.

4. The method of any one of claims 1-3, wherein the particulates comprise nickel metal complexes.

5. The method of any one of claims 1-4, wherein the particulates comprise calcium,.

6. The method of claim 1, wherein the particulates comprise sulfur.

7. The method of any one of claims 1-5, wherein the peroxyacid composition comprises a C1-C22 peroxyacid, a C1-C22 carboxylic acid, and hydrogen peroxide.

8. The method of claim 7, wherein the peroxyacid is at least one of peroxyformic, peroxyacetic, peroxypropionic, peroxybutanoic, peroxypentanoic, peroxyhexanoic, peroxyheptanoic, peroxyoctanoic, peroxynonanoic, peroxydecanoic, peroxyundecanoic, peroxydodecanoic, or the peroxyacids of their branched chain isomers, peroxylactic,

peroxymaleic, peroxyascorbic, peroxyhydroxyacetic, peroxyoxalic, peroxymalonic, peroxysuccinic, peroxyglutaric, peroxyadipic, peroxypimelic and peroxysubric acid.

9. The method of any one of claims 1-8, wherein at least 100 ppm of the peroxyacid is added to the emulsion.

10. The method of any one of claims 1-8, wherein up to 10,000 ppm of the peroxyacid is added to the emulsion.

11. The method of any one of claims 1-10, wherein at least one additional agent that is a solvent, a corrosion inhibitor, an emulsion breaker or demulsifier, a scale inhibitor, metal chelant, and/or wetting agents is added to the emulsion with the peroxyacid composition.

12. The method of any one of claims 1-11, wherein the mixture of petroleum oil and/or hydrocarbon feedstock in water is resolved in an electrostatic desalting unit.

13. The method of any one of claims 1-12, further comprising adding an effective amount of an emulsion breaker or demulsifier to aid in the separation of the hydrocarbon phase from the water phase containing the particulates.

14. The method of claim 13, further comprising settling the petroleum oil and/or hydrocarbon feedstock in a tank to enable the water, peroxyacid composition and particulates to settle on the bottom thereof from the petroleum oil and/or hydrocarbon feedstock.

15. The method of any one of claims 1-14, wherein the petroleum oil and/or hydrocarbon feedstock is a produced crude oil and is obtained from a pipeline that directs a flow of produced crude oil.

16. The method of any one of claims 1-15, wherein the petroleum oil and/or hydrocarbon feedstock once separated from the water phase does not contain any peroxyacid composition.

17. The method of any one of claims 1-16, wherein the petroleum oil and/or hydrocarbon feedstock comprise petroleum oil, crude oil, slop oil, and other hydrocarbon streams from a refinery application.

18. The method of any one of claims 1-17, wherein the method does not include the use of phosphoric or phosphorus acids.

19. A treated crude oil emulsion consisting of:
crude oil;
a peroxyacid composition for transferring metals and particulates from a hydrocarbon phase to a water phase; and
a source of water.

20. The treated crude oil emulsion of claim 19, further comprising at least one additional component that is a solvent, a corrosion inhibitor, an emulsion breaker or demulsifier, a scale inhibitor, metal chelant, and/or wetting agents.

21. A treated emulsion consisting of:
petroleum oil, crude oil, slop oil, or another hydrocarbon stream in a refinery application;
a peroxyacid composition for transferring metals and particulates from a hydrocarbon phase to a water phase; and
a source of water.

22. The treated emulsion of claim 21, further comprising at least one additional component that is a solvent, a corrosion inhibitor, an emulsion breaker or demulsifier, a scale inhibitor, metal chelant, and/or wetting agents.