[0064] What is claimed is:

1. A method of reducing corrosion of ferrous materials used to process or transport oil feedstocks, the method comprising:

obtaining a quantity of an oil feedstock, wherein the oil feedstock comprising napthenic acids such that the TAN value of the oil feedstock is greater than or equal to 1 mgKOH/g; and

reacting the quantity of the oil feedstock with an alkali metal to form a de-acidified oil feedstock, wherein the de-acidified oil feedstock has a TAN value that is less than 1 mgKOH/g,

wherein the de-acidified oil feedstock decreases the likelihood that the ferrous materials used to process or transport the oil feedstock will corrode.

2. The method as in claim 1, wherein the alkali metal comprises lithium, sodium, potassium and/or alloys thereof.

3. The method as in claim 1, wherein the TAN value of the de-acidified oil feedstock is at or near 0 mgKOH/g.

4. The method as in claim 1, wherein the de-acidified oil feedstock comprises a quantity of the alkali metal in its metallic state.

5. The method of claim 1, wherein the alkali metal further reacts with heteroatoms/heavy metals found within the oil feedstock such that a heteroatom to carbon ratio of the de-acidified oil feedstock is less than a heteroatom to carbon ratio of the first oil feedstock.

6. The method of claim 5, wherein the reaction with the alkali metal occurs in the presence of a non-oxidizing gas.

7. A method of reducing corrosion of ferrous materials used to process or transport oil feedstocks, the method comprising:

reacting an alkali metal with a quantity of an oil feedstock in the presence of a non-oxidizing gas;

removing solids formed from the reaction, thereby forming a de-acidified oil feedstock liquid;

contacting the de-acidified oil feedstock liquid with a ferrous material, wherein the de-acidified oil feedstock liquid has a TAN value of less than or equal to 1 mgKOH/g.

8. The method as in claim 7, wherein the de-acidified oil feedstock liquid further comprises a quantity of the alkali metal in its metallic state.

9. A ferrous material used to process and/or transport an oil feedstock comprising:

a quantity of a de-acidified oil feedstock within the ferrous material, wherein the de-acidified oil feedstock has a TAN value that is less than 1 mgKOH/g; and

droplets of an alkali metal, wherein , wherein the alkali metal will be oxidized before the ferrous material, thereby preventing the ferrous material from corroding.

10. A reactor comprising:

an oil feedstock material;

a quantity of an alkali metal, wherein the alkali metal reacts with the oil feedstock to reduce a TAN value of the oil feedstock to less than 1 mgKOH/g.

11. The reactor of claim 10, wherein the alkali metal is added directly to the reactor.

12. The reactor of claim 10, wherein the alkali metal is formed in situ within the reactor.

CLAIMS

What is claimed is:

1. A method comprising:

electrochemically producing an alkali metal in its metallic state, reacting an oil feedstock comprising naphthenic acids with the alkali metal in its metallic state to form a de-acidified oil feedstock, and processing and/or transporting the de-acidified oil feedstock in a ferrous material, wherein the oil feedstock has a TAN value greater than or equal to 1 mg KOH/g, and the de-acidified oil feedstock has a TAN value that is at or near 0 mg KOH/g.

2. The method of claim 1, wherein the alkali metal in its metallic state comprises lithium, sodium, potassium and/or alloys thereof.

3. The method of claim 1, wherein the de-acidified oil feedstock comprises a quantity of the alkali metal in its metallic state.

4. The method of claim 1, wherein the oil feedstock comprises heteroatoms/heavy metals, and the alkali metal further reacts with the heteroatoms/heavy metals such that a heteroatom to carbon ratio of the de-acidified oil feedstock is less than a heteroatom to carbon ratio of the oil feedstock.

5. The method of claim 4, wherein the reaction of the alkali metal occurs in the presence of a non-oxidizing gas.

6. A method comprising:

reacting an alkali metal in its metallic state with an oil feedstock in the presence of a non-oxidizing gas comprising hydrogen and/or hydrocarbon gases, wherein the oil feedstock comprises naphthenic acids and the oil feedstock has a TAN value of greater than or equal to 1 mg KOH/g;

removing solids formed from the reaction to provide a liquid de-acidified oil feedstock, and contacting the de-acidified oil feedstock liquid with a ferrous material, wherein the liquid de-acidified oil feedstock has a TAN value that is at or near 0 mg KOH/g; and

wherein the alkali metal in its metallic state is formed by electrochemically reducing alkali metal ions.

7. The method of claim 6 wherein the non-oxidizing gas comprises hydrogen, methane, natural gas, shale gas, and/or mixtures thereof.

8. The method of claim 6 wherein the non-oxidizing gas comprises methane, ethane, propane, butane, pentane, isomers of the foregoing, ethene, propene, butene, pentene, dienes, and/or mixtures thereof.