CLAIMS

1. A method for removing contaminants from a waste plastics pyrolysis stream containing the contaminants, the method comprising:

introducing to the waste plastics pyrolysis stream containing contaminants an effective amount to at least partially remove the contaminants therefrom at least one additive characterized as selected from the group consisting of crude oil demulsifiers, crude oil wax control additives, crude oil pour point reducers, dispersants/antifoulants, nanoscale metallic oxides, overbased metal oxide carbonates, and combinations thereof; and

separating the contaminants from the waste plastics pyrolysis stream by a physical process;

where the waste plastics pyrolysis stream is liquid and is at a temperature between about 100°C and about 400°C.

2. The method of claim 1 where in the waste plastics pyrolysis stream, the plastic is selected from the group consisting of polyethylene, polypropylene, polyvinylchloride, polyethylene terephthalate, polystyrene, polyurethane, polycarbonate, polyamide, polymethyl methacrylate, and combinations thereof.

3. The method of claim 1 where:

the crude oil demulsifiers are selected from the group consisting of ethoxylated and/or propoxylated alkylphenol formaldehyde resins;

the crude oil wax control additives are selected from the group consisting of poly(ethylene-co-vinylacetate);

the crude oil pour point reducers are selected from the group consisting of ethylene vinyl acetates;

the dispersants/antifoulants are selected from the group consisting of:

the maleic anhydride/olefin polymers from olefins having C16-C18 carbon atoms and weight average molecular weights of from 200 to 300;

the functionalized derivatives of maleic anhydride/olefin polymers having weight average molecular weights of from 250 to 350, selected from the group consisting of amine/polyamine derivatives, copolymers of butadiene and C16/C18 anhydrides, alcohol/polyalcohol derivatives, carboxylic/fatty acid derivatives, and combinations thereof; and

the overbased metal oxide carbonate is magnesium oxide overbase.

4. The method of any one of claims 1, 2, or 3 where the effective amount of the additive ranges from 10 to 3000 ppm based on the waste plastics pyrolysis stream.

5. The method of any one of claims 1, 2, or 3 where the physical separation process is selected from the group consisting of gravity settling, centrifugation, cyclones, and combinations thereof.

6. The method of any one of claims 1, 2, or 3 where the contaminants are solids.

7. The method of any one of claims 1, 2, or 3 where the additive is present in a solvent where:

the solvent is selected from the group consisting of gasoil, vacuum gasoil, fluid catalytic cracking light cycle oil, fluid catalytic cracking heavy cycle oil and fluid catalytic cracking slurry oil, ethylene cracker pyrolysis gasoline, ethylene cracker pyrolysis fuel oil, kerosene, naphtha, gasoline, and combinations thereof; and

the amount of additive in the solvent ranges from 1:1 to 50:1 solvent:additive by volume.

8. A method for removing contaminants from a waste plastics pyrolysis stream containing the contaminants, the method comprising:

introducing to the waste plastics pyrolysis stream containing contaminants an effective amount to at least partially remove the contaminants therefrom of at least one additive selected from the group consisting of crude oil

demulsifiers, crude oil wax control additives, crude oil pour point reducers, dispersants/antifoulants, overbased metal oxide carbonates, and combinations thereof, where the effective amount of the at least one additive is from about 10 to about 3000 ppm based on the waste plastics pyrolysis stream, where the plastic in the waste plastics pyrolysis stream is selected from the group consisting of polyethylene, polypropylene, polyvinylchloride, polyethylene terephthalate, polystyrene, polyurethane, polycarbonate, polyamide, polymethyl methacrylate, and combinations thereof; and

separating the contaminants from the waste plastics pyrolysis stream by a physical process,

where the waste plastics pyrolysis stream is liquid and is at a temperature between about 100°C and about 400°C.

9. The method of claim 8 where the physical separation process is selected from the group consisting of gravity settling, centrifugation, cyclones, and combinations thereof.

10. The method of claim 8 where the contaminants are solids selected from the group consisting of carbon material, carbon-type materials, organic polymers, inorganic solids, metal particles, metals trapped within solids, and combinations of these.

11. A method for removing contaminants from a waste plastics pyrolysis stream containing the contaminants, the method comprising:

introducing to the waste plastics pyrolysis stream containing contaminants an effective amount to at least partially remove the contaminants therefrom of at least one additive selected from the group consisting of crude oil demulsifiers, crude oil wax control additives, crude oil pour point reducers, dispersants/antifoulants, overbased metal oxide carbonates, and combinations thereof; and

separating the contaminants from the waste plastics pyrolysis stream by a physical process,

where the at least one additive is present in a solvent selected from the group consisting of gasoil, vacuum gasoil, fluid catalytic cracking light cycle oil, fluid catalytic cracking heavy cycle oil and fluid catalytic cracking slurry oil, ethylene cracker pyrolysis gasoline, ethylene cracker pyrolysis fuel oil, kerosene, naphtha, gasoline, and combinations thereof,

where the amount of additive in the solvent ranges from about 1:1 to about 50:1 solvent:additive by volume.