CLAIMS

1. A method of reducing fouling on at least one structural part of a system exposed to a fluid hydrocarbon or petrochemical stream comprising adding a polyamine to said fluid hydrocarbon or petrochemical stream, wherein said fluid hydrocarbon or petrochemical stream comprises a tight crude oil;

wherein said polyamine is an alkylene polyamine represented by the formula:

$$Z\text{-}(NH - R_1)_n X$$

wherein R_1 is an alkylene group having from about 1 to about 10 carbon atoms;

n is from about 1 to about 200,000;

X is H, NH_2, or a hydrocarbyl group having up to about 30 carbon atoms and Z is H, NH_2 or a hydrocarbyl group having up to about 30 carbon atoms,

wherein said polyamine is added to the fluid hydrocarbon or petrochemical stream in an amount ranging from about 0.1 to about 100,000 ppm based upon one million parts by volume.

2. The method as recited in claim 1, wherein said polyamine is ethylenediamine or a polyethylene polyamine.

3. The method as recited in claim 2, wherein said polyethylene polyamine is a member selected from the group consisting of:

diethylenetriamine (DETA);

triethylenetetramine (TETA);

tetraethylenepentamine (TEPA);

pentaethylenehexamine (PEHA);

hexamethyleneheptamine (HEHA), and

mixtures thereof.

4. The method as recited in claim 1, wherein said polyamine is a polypropylenimine or is a reaction product of an ephihalohydrin or ethylene dichloride with an amine reactant.

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5. The method as recited in claim 1, wherein said polyamine is formed via (1) a multi-step condensation reaction wherein a dicarboxylic acid is reacted with a polyalkylene amine reactant to form a polyamide followed by reaction of said polyamide with an epihalohydrin, or a cross linking of a polyamine reactant with a cross linking agent.

6. The method as recited in claim 1, wherein said polyamine is a reaction product of acrylic acid or copolymer thereof with polyethylenimine, or a reaction product of a polyamine reactant i) and ii) a reactant selected from a fatty acid, tall oil fatty acid, carboxylic acid, or anhydride, and an aldehyde.

7. The method of claim 6, wherein said polyamine reactant i) is selected from polyethylenepolyamine, polyethylenimine, ethyoxylated polyethylene-polyamine or polypropylenimine.

8. The method of claim 7, wherein said reactant ii) is tall oil fatty acid and i) is polyethylenimine.

9. An antifoulant composition for inhibiting fouling on structural parts of a system exposed to a fluid hydrocarbon or petrochemical stream comprising a tight crude oil, said antifoulant composition comprising: (1) a polyamine and (2) a dispersant or a fatty acid,

wherein said polyamine (1) is an alkylene polyamine represented by the formula

$$Z\text{-}(NH - R_1)_n X$$

wherein R_1 is an alkylene group having from about 1 to about 10 carbon atoms;

n is from about 1 to about 200,000;

X is H, NH_2, or a hydrocarbyl group having up to about 30 carbon atoms and Z is H, NH_2 or a hydrocarbyl group having up to about 30 carbon atoms, said polyamine having a linear, branched, or dendrimetric structure and said dispersant (2) is a member selected from group consisting of formaldehyde resins, alkyl phenol sulfides, Ca/Mg/Al salt of phosphonate phenates, polyalkylene succinimides and alkylene thiophosphonic acid esters,

wherein said antifoulant composition is added to the fluid hydrocarbon or petrochemical stream in an amount ranging from about 0.1 to about 100,000 ppm based upon one million parts by volume.

10. An antifoulant composition for inhibiting fouling on structural parts of a system exposed to a fluid hydrocarbon or petrochemical stream comprising a tight crude oil, said antifoulant composition comprising a reaction product of i) a polyamine reactant and a ii) second reactant selected from a fatty acid, tall oil fatty acid, carboxylic acid or anhydride and an aldehyde,

wherein said polyamine has a boiling point of greater than 110°C,

wherein said polyamine reactant i) is selected from polyethylenepolyamine, polyethylenimine, ethoxylated polyethylene polyamine, or polypropylenimine; and

wherein said reactant ii) is tall oil fatty acid and i) is polyethylenimine.

11. The method as recited in claim 1, wherein said tight crude oil comprises a crude oil produced from shale or tight sand formations.

12. The antifoulant composition as recited in claim 9, wherein said polyamine comprises a boiling point of greater than 110°C.

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