CLAIMS

1. A method for making a sulfide scavenger comprising reducing a settling velocity of the sulfide scavenger in a fluid hydrocarbon stream or an aqueous fluid stream by adjusting a specific gravity of the sulfide scavenger to be within fifteen percent or less of a specific gravity of the fluid hydrocarbon stream or the aqueous fluid stream,

wherein the scavenger is present from 1 percent by weight to 25 percent by weight of a total weight of a sulphide scavenger solution.

2. The method as in claim 1, wherein adjusting the specific gravity of the sulfide scavenger comprises decreasing the specific gravity of the sulfide scavenger by adding a solvent in a quantity sufficient to cause the specific gravity of the sulfide scavenger to be within five percent or less of the specific gravity of the fluid hydrocarbon stream or the aqueous fluid stream.

3. The method as in claim 2, wherein the solvent comprises at least one member selected from the group consisting of water, alcohol, glycol, and glycol ether.

4. The method as in claim 1, wherein adjusting the specific gravity of the sulfide scavenger comprises decreasing the specific gravity of the sulfide scavenger by adding an aldehyde in a concentration and a quantity sufficient to cause the specific gravity of the sulfide scavenger to be within fifteen percent or less of the specific gravity of the fluid hydrocarbon stream or the aqueous fluid stream.

5. The method as in claim 4, wherein the aldehyde comprises glyoxal.

6. A method for making a sulfide scavenger comprising reducing a settling velocity of the sulfide scavenger in a fluid hydrocarbon stream or an aqueous fluid stream by adjusting a specific gravity of a solution comprising at least one of an aldehyde, hemiacetal, acetal, hexahydrotriazine, amine, amine-aldehyde adduct, hydantoin, oxazolidine, transition metal salt, and an alkali metal hydroxide to within fifteen percent or less of a specific gravity of the fluid hydrocarbon stream or the aqueous fluid stream.

7. The method as in claim 6, wherein the sulfide scavenger comprises a non-ionic surfactant or a quarternary ammonium surfactant.

8. The method as in claim 6, wherein the transition metal salt comprises at least one cation member selected from the group consisting of zinc, iron, copper, molybdenum, cobalt, manganese, and combinations thereof, and at least one anion member selected from the group consisting of chloride, acetate, nitrate, nitrite, carbonate, citrate, phosphate, sulfate, sulfite, gluconate, and combinations thereof;

wherein the amine-aldehyde adduct comprises a reaction product of the aldehyde with at least one of polyamines, secondary amines, and combinations thereof;

wherein the aldehyde comprises at least one member selected from the group consisting of formaldehyde, glyoxal, glutaraldehyde, acrolein, glyoxylic acid, and combinations thereof;

wherein the alkali metal hydroxide comprises at least one member selected from the group consisting of sodium hydroxide and potassium hydroxide; and

wherein the hexahydrotriazine comprises a reaction product with at least one member selected from the group consisting of monoethanolamine, methylamine, methoxypropylamine, isopropanolamine and combinations thereof.

9. The method as in claim 6, wherein the hexahydrotriazine comprises monoethanolamine hexahydrotriazine or methylamine hexahydrotriazine.

10. The method as in claim 6, wherein the hemiacetal comprises a reaction product of the aldehyde with at least one alcohol selected from the group consisting of methanol, ethylene glycol, glycerol, propylene glycol, butanol, glucose, and combinations thereof.

11. The method as in claim 6, wherein the hemiacetal comprises a reaction product of

(a) ethylene glycol and formaldehyde,

(b) glycerol and formaldehyde,

(c) propylene glycol and formaldehyde,

(d) glucose and formaldehyde,

(e) glyoxal and methanol,

(f) glyoxal and ethanol,

(g) glyoxal and propanol, and/or

(h) glyoxal and butanol.

12. The method as in claim 6, wherein the hydantoin comprises at least one member selected from the group consisting of dimethylol dimethyl hydantoin, methylol dimethyl hydantoin, dimethyl hydantoin and combinations thereof.

13. A method for removing sulfide in a fluid hydrocarbon stream or an aqueous fluid stream, comprising

obtaining a measurement of a specific gravity of the fluid hydrocarbon stream or the aqueous fluid stream;

obtaining a measurement of a specific gravity of a scavenger composition comprising at least one aldehyde;

reducing a settling velocity of the scavenger composition in the fluid hydrocarbon stream or the aqueous fluid stream by adjusting the specific gravity of the scavenger composition to within fifteen percent or less of the specific gravity of the fluid hydrocarbon stream or the aqueous fluid stream; and

adding to the fluid hydrocarbon stream or an aqueous fluid stream an effective amount of the adjusted scavenger composition,

wherein the adjusted sulfide scavenger composition is added to the fluid hydrocarbon stream or the aqueous fluid stream in an amount ranging from 10 ppm to 100,000 ppm by volume of the fluid hydrocarbon stream or the aqueous fluid stream.

14. The method as in claim 13, wherein adjusting the specific gravity of the scavenger composition comprises decreasing the specific gravity of the scavenger composition by adding a solvent in a quantity sufficient to cause the specific gravity of the scavenger composition to be within ten percent or less of the specific gravity of the fluid hydrocarbon stream or the aqueous fluid stream.

15. The method as in claim 14, wherein the solvent is selected from the group consisting of water, alcohols, glycols and glycol ethers.

16. The method as in claim 13, wherein adjusting the specific gravity of the scavenger composition comprises decreasing the specific gravity of the scavenger composition by adding an aldehyde solution in a concentration and a quantity sufficient to cause the specific gravity of the scavenger composition to be within ten percent or less of the specific gravity of the fluid hydrocarbon stream or the aqueous fluid stream.

17. The method as in claim 13, wherein the at least one aldehyde comprises at least one member selected from the group consisting of formaldehyde, glyoxal, glutaraldehyde, acrolein, glyoxylic acid, and combinations thereof.

18. The method as in claim 13, wherein the aldehyde comprises glyoxal.

19. A method for removing sulfide in a fluid hydrocarbon stream or an aqueous fluid stream, comprising

obtaining a measurement of a specific gravity of the fluid hydrocarbon stream or the aqueous fluid stream;

obtaining a measurement of a specific gravity of a scavenger composition comprising at least one hexahydrotriazine;

reducing a settling velocity of the scavenger composition in the fluid hydrocarbon stream or the aqueous fluid stream by adjusting the specific gravity of the scavenger composition to within fifteen percent or less of the specific gravity of the fluid hydrocarbon stream or the aqueous fluid stream; and

adding to the fluid hydrocarbon stream or the aqueous fluid stream in an effective amount of the adjusted scavenger composition.

20. The method as in claim 19, wherein the hexahydrotriazine comprises a reaction product with at least one member selected from the group consisting of monoethanolamine, methylamine, methoxypropylamine, isopropanolamine and combinations thereof.

21. The method as in claim 19, wherein the hexahydrotriazine comprises monoethanolamine hexahydrotriazine.

22. The method as in claim 19, wherein adjusting the specific gravity of the scavenger composition comprises decreasing the specific gravity of the scavenger composition by adding a solvent in a quantity sufficient to cause the specific gravity of the scavenger composition to be within ten percent or less of the specific gravity of the fluid hydrocarbon stream or the aqueous fluid stream.