CLAIMS

What is claimed is:

1. A composition for scavenging hydrogen sulfide from a stream, comprising:
(a) a suspension of a metal component;
(b) a carrier solvent; and
(c) a polymer comprising styrene, propylene and ethylene.

2. The composition of claim 1, wherein the stream is selected from the group consisting of asphalt, crude oil, naphtha, liquefied petroleum gas, vacuum gas oil, fuel oil, atmospheric tower bottoms, bitumen, and any combination thereof.

3. The composition of claim 1 or claim 2, wherein the metal component comprises a metal oxide, a metal carbonate, a metal hydroxide, a metal alkoxide, and any combination thereof.

4. The composition of any one of claims 1 to 3, wherein the metal comprises copper, zinc, iron, and any combination thereof.

5. The composition of any one of claims 1 to 4, wherein the composition comprises from 10 wt. % to 70 wt. % of the metal component.

6. The composition of any one of claims 1 to 5, wherein the carrier solvent comprises a hydrocarbon solvent.

7. The composition of any one of claims 1 to 6, wherein the composition comprises from 30 wt. % to 90 wt. % of the carrier solvent.

8. The composition of any one of claims 1 to 7, wherein the polymer further comprises a monomer selected from isoprene, isobutylene, butadiene, and any combination thereof.

9. The composition of any one of claims 1 to 8, wherein the composition comprises from 0.1 wt. % to 10 wt. % of the polymer.

10. The composition of any one of claims 1 to 9, further comprising a metal carboxylate.

11. The composition of claim 10, wherein the metal carboxylate is selected from the group consisting of zinc carboxylate, iron carboxylate, copper carboxylate, and any combination thereof.

12. The composition of claim 10 or claim 11, wherein the composition comprises from 0.5 wt. % to 30 wt. % of the metal carboxylate.

13. The composition of any one of claims 1 to 12, further comprising a surfactant.

14. The composition of claim 13, wherein the composition comprises from 0.1 wt. % to 10 wt. % of the surfactant.

15. The composition of any one of claims 1 or 3 to 14, further comprising asphalt.

16. The composition of claim 15, wherein the asphalt comprises a treatment polymer.

17. The composition of claim 16, wherein the asphalt comprises 0.1 wt. % to 25 wt. % of the treatment polymer.

18. The composition of claim 16 or claim 17, wherein the treatment polymer comprises polyphosphoric acid.

19. The composition of any one of claims 1 to 18, wherein the composition is anhydrous or substantially free of water.

20. The composition of any one of claims 1 to 19, wherein the polymer comprises a weight average molecular weight of 1,000 Da to 500,000 Da.

21. The composition of any one of claims 1 to 20, wherein the polymer comprises 1 wt. % to 50 wt. % of the styrene, 1 wt. % to 90 wt. % of the propylene, and 1 wt. % to 90 wt. % of the ethylene.

22. A method of scavenging hydrogen sulfide from a stream, comprising:

adding a composition to the stream, the composition comprising a suspension of a metal component, a carrier solvent, and a polymer comprising styrene, propylene and ethylene.

23. The method of claim 22, wherein the stream is selected from the group consisting of asphalt, crude oil, naphtha, liquefied petroleum gas, vacuum gas oil, fuel oil, atmospheric tower bottoms, bitumen, and any combination thereof.

24. The method of claim 22 or claim 23, wherein the metal component comprises a metal oxide, a metal carbonate, a metal hydroxide, a metal alkoxide, and any combination thereof.

25. The method of any one of claims 22 to 24, wherein the metal comprises copper, zinc, iron, and any combination thereof.

26. The method of any one of claims 22 to 25, wherein the composition comprises from 10 wt. % to 70 wt. % of the metal component.

27. The method of any one of claims 22 to 26, wherein the carrier solvent comprises a hydrocarbon solvent.

28. The method of any one of claims 22 to 27, wherein the composition comprises from 30 wt. % to 90 wt. % of the carrier solvent.

29. The method of any one of claims 22 to 28, wherein the polymer further comprises a monomer selected from isoprene, isobutylene, butadiene, and any combination thereof.

30. The method of any one of claims 22 to 29, wherein the composition comprises from 0.1 wt. % to 10 wt. % of the polymer.

31. The method of any one of claims 22 to 30, further comprising adding a metal carboxylate to the stream.

32. The method of claim 31, wherein the metal carboxylate is selected from the group consisting of zinc carboxylate, iron carboxylate, copper carboxylate, and any combination thereof.

33. The method of claim 31 or claim 32, wherein the composition comprises from 0.5 wt. % to 30 wt. % of the metal carboxylate.

34. The method of any one of claims 22 to 33, further comprising adding a surfactant to the stream.

35. The method of claim 34, wherein the composition comprises from 0.1 wt. % to 10 wt. % of the surfactant.

36. The method of any one of claims 22 to 35, wherein the stream comprises asphalt.

37. The method of claim 36, wherein a treatment polymer is added to the asphalt.

38. The method of claim 37, wherein the asphalt comprises 0.1 wt. % to 25 wt. % of the treatment polymer.

39. The method of claim 37 or claim 38, wherein the treatment polymer comprises polyphosphoric acid.