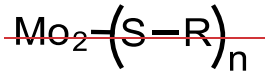
WHAT IS CLAIMED IS:

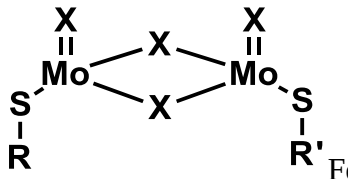
1. A method of inhibiting corrosion of a metal surface that is contacted by a hydrocarbon fluid source containing acidic corrodents, comprising:

introducing into ~~a~~ the hydrocarbon fluid source containing acidic corrodents a phosphorus-free, sulfur-containing molybdenum complex having the general formula selected from Formula ~~I or~~ II:



~~Formula I~~

~~Wherein R represents an oxygen, nitrogen or carbon-containing compounds such as alcohols, alkyl, alkenyl, amides, amines, or aryl groups; n is 4-10.~~



Formula II

wherein R and R' each represents a group selected from an alkyl group comprising one or more hydroxyl groups, an alkyl group, an alkenyl group, or an aryl group~~an oxygen, nitrogen or carbon-containing compounds such as alcohols, alkyl, alkenyl, amides, amines, or aryl groups~~; and each X represents oxygen or sulfur and can be the same or different but where at least one X in ~~the formula~~Formula II is sulfur.

~~2. The method of claim 1, wherein the introducing is by injecting or pumping.~~

~~3. The method as in one of claims 1-2, wherein the fluid source contacts a metal containment.~~

~~4~~2. The method as in ~~one of claims 1-3~~claim 1, wherein the hydrocarbon fluid source is in contact with a distillation column, a stripper, a tray~~distillation columns, strippers, trays~~, or piping.

~~5~~3. The method as in ~~one of claims 1-4~~claim 1 or 2, wherein the hydrocarbon fluid source comprises a liquid hydrocarbon fraction.

~~6~~4. The method of claim ~~5~~3, wherein the hydrocarbon fraction is a distillate.

~~7~~5. The method as in one of claims ~~1-6~~1, 2 or 3, wherein the acidic corrodents comprise naphthenic acid, sulfur or combinations thereof.

~~8~~6. The method as in one of claims 1-~~7~~5, wherein the hydrocarbon fluid source comprises a total acid number (TAN) of 0.2 to 20.

~~9~~7. The method as in one of claims ~~1-8~~1, 2, or 3-6, wherein the hydrocarbon fluid source has a temperature that is in a range from ~~is about~~ 175°C to 600°C.

8. The method of claim 1, wherein R or R' comprises one or more hydroxy groups.

9. The method of claim 1, wherein R or R' comprises an alkyl group.

10. The method of claim 1, wherein R or R' comprises an alkenyl group.

11. The method of claim 1, wherein R or R' comprises an aryl group.

12. The method of claim 11, wherein the aryl group is substituted.

13. The method of claim 9, wherein the alkyl group comprises 2 to 30 carbon atoms.

14. The method of claim 9, wherein the alkyl group comprises 5 to 10 carbon atoms.

15. The method of claim 1, wherein the acidic corrodent comprises a naphthenic acid.

16. The method of claim 1, wherein the hydrocarbon fluid source comprises crude oil.

17. The method of claim 1, wherein the phosphorus-free, sulfur-containing molybdenum complex is introduced into a distillation column.

18. The method of claim 1, wherein the introducing step comprises introducing a composition into the hydrocarbon fluid source, wherein the composition comprises the phosphorus-free, sulfur-containing molybdenum complex and one or more other additives.

19. The method of claim 18, wherein the one or more other additives comprise an asphaltene inhibitor.

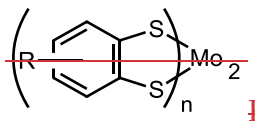
20. The method of claim 18, wherein the one or more other additives comprise a paraffin inhibitor.

21. The method of claim 18, wherein the one or more other additives comprise a dispersant.

~~10. The method as in one of claims 1-9, wherein the sulfur-containing molybdenum complex is added to the fluid source from 1 ppm to 3,000 ppm.~~

~~11. The method as in one of claims 1-10, wherein the sulfur-containing molybdenum complex further comprises one or more, asphaltene inhibitors, paraffin inhibitors, dispersants, emulsion breakers, or any combination thereof.~~

~~12. The method as in one of claims 1-11, wherein the sulfur-containing molybdenum complex has the general formula III:~~



~~Formula III~~

~~Wherein R represents an oxygen, nitrogen or carbon-containing compounds such as alcohols, alkyl, alkenyl, amides, amines, or aryl groups; n is 2-6.~~

~~13. The method as in one of claims 1-12, wherein the R, R'-comprise each an alkyl group (linear, branched, or cyclic) with or without saturation or heteroatoms or both; thiolates, sulfides, thiocarbamates, thiocarbonates, thioacids, aromatic rings with or without~~

substituents, organic polysulfides, inorganic polysulfides, polymers thereof and combinations thereof.

14. The method as in one of claims 1-13, wherein the R, R' comprise each disulfides, dithiolates, dithiocarbamates, dithiocarbonates, dithioacids, inorganic polysulfides, organic polysulfides, polymers thereof and mixtures thereof.

15. The method of claim 14, wherein the organic polysulfide has the general formula IV:

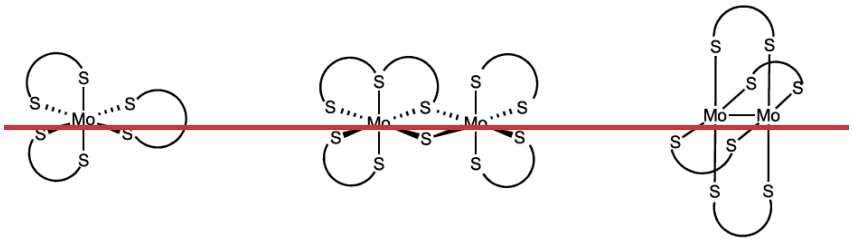
$R^2—S_x—R^3$ Formula IV

Wherein R^2 and R^3 each represents an oxygen, nitrogen or carbon-containing ligands such as alcohols, alkyl, alkenyl, amides, amines, or aryl groups; and R^2 and R^3 can be the same or different.

16. The method of claim 15, wherein the R^2 and R^3 comprise each an alkyl group (linear, branched, or cyclic) with or without saturation or heteroatoms or both; thiolates, sulfides, thiocarbamates, thiocarbonates, thioacids, aromatic rings with or without substituents, organic polysulfides, inorganic polysulfides, polymers thereof and combinations thereof.

17. The method as in one of claims 15-16, wherein the R^2 and R^3 comprise each an alkyl group (linear, branched, or cyclic) with or without saturation or heteroatoms or both; thiolates, sulfides, thiocarbamates, thiocarbonates, thioacids, aromatic rings with or without substituents, organic polysulfides, inorganic polysulfides, polymers thereof and combinations thereof.

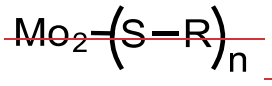
18. The method as in one of claims 1-17, wherein the sulfur-containing molybdenum complex comprises the following:



Wherein the arcs represent alkyl chains (linear, branched and cyclic) with or without saturation or heteroatoms or both; thiolates, sulfides, thiocarbamates, thiocarbonates, thioacids, aromatic rings with or without substituents, organic polysulfides, or inorganic polysulfides.

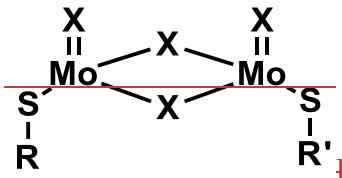
19. The method as in one of claims 1-18, wherein the sulfur-containing molybdenum complex provides at least 70% corrosion protection in a 1018 carbon steel coupon test.

20. A composition comprising a sulfur-containing molybdenum complex to inhibit corrosion in a fluid source containing corrodents and in contact with a metal containment, the sulfur-containing molybdenum complex comprising the formula selected from Formula I or II:



Formula I

Wherein R represents an oxygen, nitrogen or carbon-containing compounds such as alcohols, alkyl, alkenyl, amides, amines, or aryl groups; n is 4-10.



Formula II

R and R' each represents an oxygen, nitrogen or carbon-containing compounds such as alcohols, alkyl, alkenyl, amides, amines, or aryl groups; and X represents oxygen or sulfur and can be the same or different but where at least one X in the formula is sulfur.

21. The composition of claim 20, wherein the composition further comprises one or more, asphaltene inhibitors, paraffin inhibitors, dispersants, emulsion breakers, or any combination thereof.

22. The composition as in one of claims 20-21, wherein the fluid source is in contact with distillation columns, strippers, trays, or piping.

23. The composition as in one of claims 20-22, wherein the fluid source comprises at least a liquid hydrocarbon fraction.

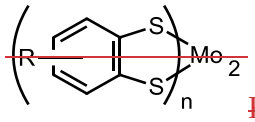
24. The composition as in one of claims 20-23, wherein the hydrocarbon fraction is a distillate.

25. The composition as in one of claims 20-24, wherein the corrodents comprise naphthenic acid, sulfur, or combinations thereof.

26. The composition as in one of claims 20-25, wherein the fluid source comprises a TAN of 0.2-20.

27. The composition as in one of claims 20-26, wherein the fluid source temperature is 175°C to 600°C.

28. The composition as in one of claims 20-27, wherein the sulfur-containing molybdenum complex has the general formula III:



Formula III

Wherein R represents an oxygen, nitrogen or carbon-containing compounds such as alcohols, alkyl, alkenyl, amides, amines, or aryl groups; n is 2-6.

29. The composition as in one of claims 20-28, wherein the R, R' comprise each an alkyl group (linear, branched, or cyclic) with or without saturation or heteroatoms or both; thiolates, sulfides, thiocarbamates, thiocarbonates, thioacids, aromatic rings with or without substituents, organic polysulfides, inorganic polysulfides, polymers thereof and combinations thereof.

30. The composition as in one of claims 20-29, wherein the R, R' comprise each disulfides, dithiolates, dithiocarbamates, dithiocarbonates, dithioacids, inorganic polysulfides, organic polysulfides, polymers thereof and mixtures thereof.

31. The composition of claim 30, wherein the organic polysulfide has the general formula IV:

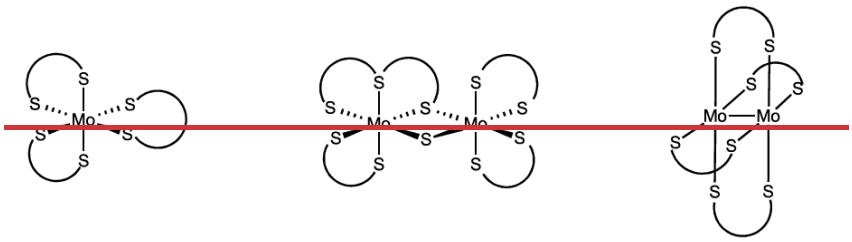
$R^2—S_x—R^3$ Formula IV

Wherein R^2 and R^3 each represents an oxygen, nitrogen or carbon-containing ligands such as alcohols, alkyl, alkenyl, amides, amines, or aryl groups; and R^2 and R^3 can be the same or different.

32. The composition of claim 31, wherein the R^2 and R^3 comprise each an alkyl group (linear, branched, or cyclic) with or without saturation or heteroatoms or both; thiolates, sulfides, thiocarbamates, thiocarbonates, thioacids, aromatic rings with or without substituents, organic polysulfides, inorganic polysulfides, polymers thereof and combinations thereof.

33. The composition as in one of claims 31-32, wherein the R^2 and R^3 comprise each an alkyl group (linear, branched, or cyclic) with or without saturation or heteroatoms or both; thiolates, sulfides, thiocarbamates, thiocarbonates, thioacids, aromatic rings with or without substituents, organic polysulfides, inorganic polysulfides, polymers thereof and combinations thereof.

34. The composition as in one of claims 20-33, wherein the sulfur-containing molybdenum complex comprises the following:



Wherein the arcs represent alkyl chains (linear, branched and cyclic) with or without saturation or heteroatoms or both; thiolates, sulfides, thiocarbamates,

thiocarbonates, thioacids, aromatic rings with or without substituents, organic polysulfides, or inorganic polysulfides.

35. The composition as in one of claims 20-34, wherein the sulfur-containing molybdenum complexes are about 1 ppm to 3,000 ppm of the composition.

36. A composition comprising:

a fluid source; and at least one sulfur-containing molybdenum complex as in one of claims 20-35.

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37. A treated metal containment comprising:

a metal containment comprising a metal surface; and the fluid source comprising the sulfur-containing molybdenum complex as in one of claims 20-36, wherein at least a portion of the metal surface is contacted by the fluid source.

38. The treated metal containment of claim 37, wherein the metal surface comprises carbon (mild) steel or higher alloy.

39. The treated metal containment as in one of claims 37-38, wherein the metal containment comprises a tank, pipe, distillation column strippers, trays, or piping.

40. The treated metal containment as in one of claims 37-39, wherein the fluid comprises, gas, liquid hydrocarbon, and optionally water.

41. Use of the sulfur-containing molybdenum complex as in one of claims 1-40 to inhibit corrosion.

42. Use of the sulfur-containing molybdenum complex as in one of claims 1-40 to treat a fluid source comprising one or more corrodents and the fluid source in contact with a containment.

~~43. Use of the sulfur-containing molybdenum complex as in one of claims 1-40 to inhibit corrosion of a metal containment comprising a fluid source comprising one or more corrodents.~~