be caused by employing method of US'127. Even the US'975 does not discuss US'842 and US'127.

The US publication no. US 2004/0096382 A1 discloses a process for reducing level of hydrogen sulphide in a liquid or gas by treating the liquid or gas with an H_2S scavenger product derivable by reaction of a carbonyl group-containing compound with an alcohol, thiol, amide, thioamide, urea or thiourea, and the carbonyl group-containing compound is preferably formaldehyde.

The PCT publication no. WO 2010/128523 discloses a hydrogen sulfide scavenging additive for scavenging hydrogen sulfide in hydrocarbons by forming water soluble scavenged products which get separated from the hydrocarbon at acidic pH without causing fouling and decomposition problems, and the additive consists of aldehyde, or aldehyde and polyethylene glycol [PEG], and the aldehyde is glyoxylic acid.

Need of the Invention:

Accordingly, there is still a need of an additive composition and method which is suitable for scavenging sulfur containing compounds including hydrogen sulfide, particularly hydrogen sulfide in the hydrocarbons or hydrocarbon streams, and overcomes one or more of above-described problems of the prior art, and which at least comprises substantially reduced amount of glyoxal, and is also required in substantially reduced amount to scavenge the sulfur containing compounds, and also acts at a faster rate to scavenge the sulfur containing compounds, and neither comprises 'nitrogen containing compound' nor 'an halide compound'.

Problem to be solved by the Invention:

Therefore, the present invention aims at providing a solution to one or more of above-described existing industrial problems by providing the additive composition and method which is capable of scavenging sulfur containing compounds including hydrogen sulfide, particularly hydrogen sulfide in the hydrocarbons or hydrocarbon streams without causing any problem, wherein the additive composition comprises substantially reduced amount of glyoxal, and is also required in substantially reduced amount to scavenge the sulfur containing compounds, and also acts at a faster rate to scavenge the sulfur containing compounds, and neither comprises 'nitrogen containing compound' nor 'an halide compound'.

Objects of the Invention:

Accordingly, the main object of present invention is to provide an additive composition for scavenging hydrogen sulfide in hydrocarbons or hydrocarbon streams wherein said additive composition is capable of scavenging or removing hydrogen sulfide from the hydrocarbons or hydrocarbon stream, and wherein the additive composition comprises substantially reduced amount of glyoxal, and the composition is also required in substantially reduced amount to scavenge the sulfur containing compounds, and the composition also acts at a faster rate to scavenge the sulfur containing compounds, and the composition neither comprises 'nitrogen containing compound' nor 'an halide compound'.

comprising polymer made from ethylene oxide, polymer made from propylene oxide, polymer made from butylene oxide, copolymer of polymers made from propylene oxide and ethylene oxide, and copolymer of polymers made from propylene oxide and butylene oxide, the hydrogen sulfide is scavenged or removed. However, the inventor has found that the capability of glyoxal to scavenge hydrogen sulfide, surprisingly and unexpectedly, gets substantially enhanced to a greater extent when polymer compound is polymer made from propylene oxide, and not when polymer compound is polymer made from ethylene oxide, copolymer of polymers made from propylene oxide and ethylene oxide. which confirms that the polymer made from propylene oxide has surprising and unexpected synergistic effect to substantially enhance scavenging capability of glyoxal, which otherwise, as found by the inventor, does has scavenging capability, but when used in comparatively very higher amounts.

Accordingly, in main embodiment, the present invention, relates to additive composition for scavenging hydrogen sulfide in hydrocarbons or hydrocarbon streams, wherein said additive composition ~~comprises~~ consists of glyoxal and polymer compound which is polymer made from propylene oxide.

In accordance with present invention, the additive composition comprising glyoxal and polymer made from propylene oxide has been found to be capable of scavenging or removing hydrogen sulfide from the hydrocarbons or hydrocarbon stream.

Accordingly, in another embodiment, the present invention, also relates to ~~method of using~~ use of additive composition for scavenging hydrogen sulfide in hydrocarbons or hydrocarbon streams, wherein ~~the hydrocarbons or hydrocarbon stream is treated with~~ an additive composition is added to the hydrocarbons or hydrocarbon stream for ~~which scavenges~~ scavenging or ~~removes~~ removing hydrogen sulfide from the hydrocarbons or hydrocarbon stream, and wherein said additive composition comprises glyoxal and polymer compound which is polymer made from propylene oxide.

In accordance with present invention, when additive composition comprising glyoxal and polymer made from propylene oxide is employed in hydrocarbons or hydrocarbon streams comprising sulfur containing compounds, the additive composition of present invention scavenges or removes sulfur containing compounds including hydrogen sulfide from the hydrocarbons or hydrocarbon stream.

Accordingly, in another embodiment, the present invention, also relates to a method for scavenging sulfur containing compounds including hydrogen sulfide from the

hydrocarbons or hydrocarbon stream, wherein the hydrocarbons or hydrocarbon stream is treated with an additive composition which scavenges or removes sulfur containing

Claims

1. Additive composition for scavenging hydrogen sulfide in hydrocarbons or hydrocarbon streams, wherein said additive composition consists of glyoxal and polymer compound which is polymer made from propylene oxide.
2. Additive composition as claimed in claim 1, wherein glyoxal and polymer compound are taken in an amount varying between 99 parts of glyoxal to 0.1 part of polymer compound and 0.1 part of glyoxal to 99 parts of polymer compound.
3. Additive composition as claimed in claim 1 or 2, wherein amount of the polymer compound is selected from the group comprising ~~varies~~ varying upto ~~about~~ 25% by weight, ~~preferably~~ upto ~~about~~ 10% by weight or upto ~~about~~ 5% by weight of the composition.
4. Additive composition as claimed in any one of the preceding claims 1 to 3, wherein said polymer made from propylene oxide is polypropylene glycol.
5. Additive composition as claimed in any one of the preceding claims 1 to 4, wherein said polymer made from propylene oxide is polypropylene glycol having ~~about~~ 200 to ~~about~~ 800 dalton molecular weight.
6. Additive composition as claimed in any one of the preceding claims 1 to 5, wherein said polymer made from propylene oxide is polypropylene glycol having ~~about~~ 200 to ~~about~~ 600, ~~preferably~~ or ~~about~~ 400 dalton molecular weight.
7. Additive composition as claimed in any one of the preceding claims 1 to 6, wherein composition does not comprise 'nitrogen containing compound'.
8. Additive composition as claimed in any one of the preceding claims 1 to 7, wherein composition does not comprise 'an halide compound'.
9. Use of additive composition for scavenging hydrogen sulfide in hydrocarbons or hydrocarbon streams, wherein an additive composition is added to the hydrocarbons or hydrocarbon stream for scavenging or removing hydrogen sulfide from the hydrocarbons or hydrocarbon stream, and wherein said additive composition comprises glyoxal and polymer compound which is polymer made from propylene oxide.
10. Use as claimed in claim 9, wherein glyoxal and polymer compound are taken in an amount varying between 99 parts of glyoxal to 0.1 part of polymer compound and 0.1 part of glyoxal to 99 parts of polymer compound.

11. Use as claimed in claim 9 or 10, wherein amount of the polymer compound is selected from the group comprising varying ~~varies~~ upto ~~about~~ 25% by weight, ~~preferably~~ upto ~~about~~ 10% by weight or upto ~~about~~ 5% by weight of the composition.

12. Use as claimed in any one of the preceding claims 9 to 11, wherein said polymer made from propylene oxide is polypropylene glycol.

13. Use as claimed in any one of the preceding claims 9 to 12, wherein said polymer made from propylene oxide is polypropylene glycol having ~~about~~ 200 to ~~about~~ 800 dalton molecular weight.

14. Use as claimed in any one of the preceding claims 9 to 13, wherein said polymer made from propylene oxide is polypropylene glycol having ~~about~~ 200 to ~~about~~ 600, ~~preferably~~ or ~~about~~ 400 dalton molecular weight.

15. Use as claimed in any one of the preceding claims 9 to 14, wherein said hydrocarbon streams includes crude oil, fuel oil, sour gas, and asphalts and refined products contained in storage tanks, vessels, pipelines.

16. Use as claimed in any one of the preceding claims 9 to 15, wherein composition does not comprise 'nitrogen containing compound'.

17. Use as claimed in any one of the preceding claims 9 to 16, wherein composition does not comprise 'an halide compound'.

18. A method for scavenging sulfur containing compounds including hydrogen sulfide from the hydrocarbons or hydrocarbon stream, wherein the hydrocarbons or hydrocarbon stream is treated with an additive composition which scavenges or removes sulfur containing compounds including hydrogen sulfide from the hydrocarbons or hydrocarbon stream, and wherein said additive composition comprises glyoxal and polymer compound which is polymer made from propylene oxide.

19. A method as claimed in claim 18, wherein glyoxal and polymer compound are taken in an amount varying between 99 parts of glyoxal to 0.1 part of polymer compound and 0.1 part of glyoxal to 99 parts of polymer compound.

20. A method as claimed in claim 18 or 19, wherein amount of the polymer compound is selected from the group comprising varying ~~varies~~ upto ~~about~~ 25% by weight, ~~preferably~~ or upto ~~about~~ 10% by weight or upto ~~about~~ 5% by weight of the composition.

21. A method as claimed in any one of the preceding claims 19 to 20, wherein said polymer made from propylene oxide is polypropylene glycol.

22. A method as claimed in any one of the preceding claims 18 to 21, wherein said polymer made from propylene oxide is polypropylene glycol having ~~about~~ 200 to ~~about~~ 800 dalton molecular weight.

23. A method as claimed in any one of the preceding claims 18 to 22, wherein said polymer made from propylene oxide is polypropylene glycol having ~~about~~ 200 to ~~about~~ 600, ~~preferably~~ or ~~about~~ 400 dalton molecular weight.

24. A method as claimed in any one of the preceding claims 18 to 23, wherein said hydrocarbon streams includes crude oil, fuel oil, sour gas, and asphalts and refined products contained in storage tanks, vessels, pipelines.

25. A method as claimed in any one of the preceding claims 18 to 24, wherein composition does not comprise 'nitrogen containing compound'.

26. A method as claimed in any one of the preceding claims 18 to 25, wherein composition does not comprise 'an halide compound'.

27. A method as claimed in any one of the preceding claims 18 to 26, wherein composition is added in an amount varying from ~~about~~ 1 to ~~about~~ 4000 ppm by weight of hydrocarbon or hydrocarbon stream.

28. A method as claimed in any one of the preceding claims 18 to 27, wherein composition is injected in the flow lines in case of development stage of a field or in small producing fields.

29. A method as claimed in any one of the preceding claims 18 to 28, wherein gas containing hydrogen sulfide is passed through an absorption tower wherein scavenging composition has been injected in case of large production facilities.

30. A method as claimed in any one of the preceding claims 18 to 29, wherein composition is added to crude oil when it is passing through the desalter or is being treated with wash water in the crude oil processing system.