Claims

~~1. An additive capable of removing calcium from crude oil or its blends containing calcium naphthenate at low pH of about 3 to about 4, and also at high pH of about 5 or more of the wash water for the desalter used in the crude oil processing systems, characterized in that the additive is glyoxal.~~

~~2. An additive as claimed in claim 1, wherein said high pH varies between about 6 to about 11, particularly between about 7 to about 9.~~

~~3. An additive as claimed in claim 1 or 2, wherein said high pH of wash water is due to addition or presence of alkaline medium in the wash water.~~

~~4. An additive as claimed in claim 3, wherein said alkaline medium is selected from the group comprising sodium hydroxide (NaOH or caustic), ammonia or amine compound, or mixture thereof.~~

~~5~~1. A method for removing calcium from crude oil or its blends containing calcium naphthenate at low pH of about 3 to about 4, and also at high pH of about 5 or more of the wash water used in the crude oil processing systems, **characterized in that** the crude oil or its blends containing calcium naphthenate is treated with an additive, and the additive is glyoxal.

~~6~~2. A method as claimed in claim ~~5~~1, wherein said high pH varies between about 6 to about 11, particularly between about 7 to about 9.

~~7~~3. A method as claimed in claim ~~5~~1 or ~~6~~2, wherein said high pH of wash water is due to addition or presence of alkaline medium in the wash water.

~~8~~4. A method as claimed in claim ~~7~~3, wherein said alkaline medium is selected from the group comprising sodium hydroxide (NaOH or caustic), ammonia or amine compound, or mixture thereof.

~~9~~5. A method as claimed in any one of claims ~~5~~1 to ~~8~~4, wherein said glyoxal additive is added in a mole ratio of additive to calcium concentration varying from about 1:0.9 to 1:4, preferably about 1:2.

~~10~~6. A method as claimed in any one of claims ~~5~~1 to ~~9~~5, wherein said crude oil or blends thereof and glyoxal additive are reacted at a temperature of about 80^0C to 160^0C.

~~11~~7. A method as claimed in any one of claims ~~5~~1 to ~~10~~6, wherein said glyoxal is used alone and not with an acid.

~~12~~8. A method as claimed in any one of claims ~~5~~1 to ~~11~~7, wherein said wash water is used in the desalter of crude oil processing systems.

~~13~~9. A method as claimed in any one of claims ~~5~~1 to ~~11~~7, wherein said calcium removal from crude oil or blends thereof includes removal of calcium from oil or its blends in oil production units comprising electrostatic separators or precipitators.

~~14~~10. Use of glyoxal for removal of calcium from crude oil or its blends containing calcium naphthenate at low pH of about 3 to about 4, and also at high pH of about 5 or more of the wash water for the desalter used in the crude oil processing systems, **characterized in that** crude oil or its blends containing calcium naphthenate is treated with glyoxal.

~~15~~11. Use of glyoxal as claimed in claim ~~14~~10, wherein said high pH varies between about 6 to about 11, particularly between about 7 to about 9.

~~16~~12. Use of glyoxal as claimed in claim ~~14~~10 or ~~15~~11, wherein said high pH of wash water is due to addition or presence of alkaline medium in the wash water.

~~17~~13. Use of glyoxal as claimed in claim ~~16~~12, wherein said alkaline medium is selected from the group comprising sodium hydroxide (NaOH or caustic), ammonia or amine compound, or mixture thereof.

~~18~~14. Use of glyoxal as claimed in any one of claims ~~14~~10 to ~~17~~13, wherein said glyoxal is used alone and not with an acid.