formed at the interphase of organic and aqueous layers surprisingly and unexpectedly get disappeared or dissolved.

According to an aspect, there is provided a method to remove metals comprising calcium from crude oil or mixture of crude oils containing calcium naphthenate and sulfur compound comprising H_2S, wherein said method simultaneously

(i) avoids formation of impurities and/or

(ii) removes the impurities, if already formed and accumulated at an interphase of organic and aqueous layers,

(iii) wherein said impurities are formed on account of reaction between the calcium naphthenate and the sulfur compound comprising H_2S in presence of water in the crude oil or the mixture of crude oils containing the calcium naphthenate and the sulfur compound comprising H_2S, and

(iv) comprises treating the crude oil or said mixture of crude oils containing the calcium naphthenate and the sulfur compound comprising H_2S with additive consisting of glyoxylic acid.

According to another aspect, there is provided a method comprising using an additive consisting of glyoxylic acid for removing metals comprising calcium from crude oil or mixture of crude oils containing calcium naphthenate and sulfur compound comprising H_2S, wherein said method simultaneously

(i) avoids formation of impurities, and/or

(ii) removes the impurities, if already formed and accumulated at an interphase of organic and aqueous layers,

(iii) wherein said impurities are formed on account of reaction between the calcium naphthenate and the sulfur compound comprising H_2S in presence of water in the crude oil or the mixture of crude oils containing the calcium naphthenate and the sulfur compound comprising H_2S, and

(iv) wherein said crude oil or said mixture of crude oils containing the calcium naphthenate and the sulfur compound comprising H_2S is treated with the additive consisting of glyoxylic acid.

Accordingly, the present invention relates to an additive capable of avoiding formation of impurities, and capable of removing or dissolving impurities already formed and accumulated at the interphase of organic and aqueous layers on reaction between calcium naphthenate and sulfur compound including H_2S in presence of water in mixture of crude oils containing calcium naphthenate and sulfur compound including H_2S, wherein the additive is glyoxylic acid.

In one embodiment, the present invention relates to an additive capable of avoiding formation of impurities on reaction between calcium naphthenate and sulfur compound including H_2S in presence of water in mixture of crude oils containing calcium naphthenate and sulfur compound including H_2S, wherein the additive is glyoxylic acid.

In another embodiment, the present invention relates to an additive capable of removing or dissolving impurities already formed on reaction between calcium naphthenate and sulfur compound including H_2S in presence of water and accumulated at the interphase of organic and aqueous layers in mixture of crude oils containing calcium naphthenate and sulfur compound including H_2S, wherein the additive is glyoxylic acid.

In still another embodiment, the present invention relates to a method for avoiding formation of impurities, and for removing or dissolving impurities already formed and accumulated at the interphase of organic and aqueous layers on reaction between calcium naphthenate and sulfur compound including H_2S in presence of water in mixture of crude oils containing calcium naphthenate and sulfur compound including H_2S, comprising step of treatment of mixture of crude oils containing calcium naphthenate and sulfur compound including H_2S with glyoxylic acid.

In one embodiment, the present invention relates to a method for avoiding formation of impurities on reaction between calcium naphthenate and sulfur compound including H_2S in presence of water in mixture of crude oils containing calcium naphthenate and sulfur compound including H_2S, comprising step of treatment of mixture of crude oils containing calcium naphthenate and sulfur compound including H_2S with glyoxylic acid.

In another embodiment, the present invention relates to a method for removing or dissolving impurities already formed and accumulated at the interphase of organic

Claims

1. An additive capable of avoiding formation of impurities and removing the impurities, if already formed and accumulated at the interphase of organic and aqueous layers on reaction between calcium naphthenate and sulfur compound including H_2S in presence of water in mixture of crude oils containing calcium naphthenate and sulfur compound including H_2S, wherein the additive is glyoxylic acid.

2. An additive capable of avoiding formation of impurities on reaction between calcium naphthenate and sulfur compound including H_2S in presence of water in mixture of crude oils containing calcium naphthenate and sulfur compound including H_2S, wherein the additive is glyoxylic acid.

3. An additive capable of removing impurities formed and accumulated at the interphase of organic and aqueous layers on reaction between calcium naphthenate and sulfur compound including H_2S in presence of water in mixture of crude oils containing calcium naphthenate and sulfur compound including H_2S, wherein the additive is glyoxylic acid.

4. An additive capable of removing metals including calcium from crude oil or mixture of crude oils containing calcium naphthenate and sulfur compound including H_2S, and simultaneously capable of avoiding formation of impurities and removing the impurities, if already formed and accumulated at the interphase of organic and aqueous layerson account of reaction between calcium naphthenate and sulfur compound including H_2S in presence of water in mixture of crude oils containing calcium naphthenate and sulfur compound including H_2S, wherein the additive is glyoxylic acid.

5. A method for avoiding formation of impurities and removing the impurities, if already formed and accumulated at the interphase of organic and aqueous layers on reaction between calcium naphthenate and sulfur compound including H_2S in presence of water in mixture of crude oils containing calcium naphthenate and sulfur compound including H_2S, comprising step of treatment of said mixture of crude oils containing calcium naphthenate and sulfur compound including H_2S with glyoxylic acid.

6. A method for avoiding formation of impurities on reaction between calcium naphthenate and sulfur compound including H_2S in presence of water in

~~mixture of crude oils containing calcium naphthenate and sulfur compound including H_2S, comprising step of treatment of mixture of crude oils containing calcium naphthenate and sulfur compound including H_2S with glyoxylic acid.~~

~~7. A method for removing impurities already formed and accumulated at the interphase of organic and aqueous layers on reaction between calcium naphthenate and sulfur compound including H_2S in presence of water in mixture of crude oils containing calcium naphthenate and sulfur compound including H_2S, comprising step of treatment of said mixture of crude oils containing calcium naphthenate and sulfur compound including H_2S with glyoxylic acid.~~

~~8~~1. A method to remove metals ~~including~~ comprising calcium from crude oil or mixture of crude oils containing calcium naphthenate and sulfur compound ~~including~~ comprising H_2S, and wherein said method simultaneously

(i) ~~to~~ avoids formation of impurities and/or

(ii) ~~to~~ removes the impurities, if already formed and accumulated at ~~the~~ an interphase of organic and aqueous layers,

(iii) ~~characterized in that~~ wherein said impurities are formed on account of reaction between the calcium naphthenate and the sulfur compound ~~including~~comprising H_2S in presence of water in the crude oil or the mixture of crude oils containing the calcium naphthenate and the sulfur compound ~~including~~comprising H_2S, and

(iv) ~~comprising~~ comprises treating the crude oil or said mixture of crude oils containing the calcium naphthenate and the sulfur compound ~~including~~comprising H_2S with additive consisting of glyoxylic acid.

~~9~~2. A method as claimed in ~~any one of~~ claims ~~5, 6 and 8~~1, wherein for avoiding formation of impurities the additive is added before separating organic and aqueous phases.

~~10~~3. A method as claimed in ~~any one of~~ claims ~~5, 7 and 8~~ 1 or 2, wherein for removing the impurities already formed comprises addition of the additive consisting of glyoxylic acid after the impurities have formed.

~~11~~4. A method as claimed in any one of claims ~~5, 7, 8 and 10~~ 1 to 3, wherein pH of the aqueous layer is 7 or more.

~~12~~5. A method as claimed in claim ~~11~~ 4, wherein the pH of the aqueous layer varies from 7 to 9.

~~13~~6. A method as claimed in any one of ~~the preceding~~ claims ~~5-12~~ 1 to 5, wherein the additive is added either along with water or after dissolving in water.

~~14~~7. A method as claimed in any one of ~~the preceding~~ claims ~~5-13~~ 1 to 6, wherein the additive is added in a stoichometric amount or a double stoichometric equivalent to calcium concentration.

~~15~~8. A method as claimed in any one of ~~the preceding~~ claims ~~5-13~~ 1 to 7, wherein the additive is added either in stoichometric amount or ~~little~~ in excess with respect to the calcium concentration.

~~16. An additive capable of avoiding formation of impurities and removing the impurities substantially as herein described with the help of foregoing examples and as illustrated in the accompanying figures.~~

~~17. A method for avoiding formation of impurities and removing the impurities substantially as herein described with the help of foregoing examples and as illustrated in the accompanying figures.~~

~~18. A method to remove metals including calcium from crude oil or mixture of crude oils containing calcium naphthenate and sulfur compound including H_2S substantially as herein described with the help of foregoing examples and as illustrated in the accompanying figures.~~

9. A method comprising using an additive consisting of glyoxylic acid for removing metals comprising calcium from crude oil or mixture of crude oils containing calcium naphthenate and sulfur compound comprising H_2S, wherein said method simultaneously

(i) avoids formation of impurities, and/or

(ii) removes the impurities, if already formed and accumulated at an interphase of organic and aqueous layers,

(iii) wherein said impurities are formed on account of reaction between the calcium naphthenate and the sulfur compound comprising H_2S in presence of water in the crude oil or the mixture of crude oils containing the calcium naphthenate and the sulfur compound comprising H_2S, and

(iv) wherein said crude oil or said mixture of crude oils containing the calcium naphthenate and the sulfur compound comprising H_2S is treated with the additive consisting of glyoxylic acid.

10. The method as claimed in claim 9, wherein for avoiding formation of impurities the additive is added before separating the organic and the aqueous phases.

11. The method as claimed in claim 9 or 10, wherein for removing the impurities already formed comprises addition of the additive after the impurities have formed.

12. The method as claimed in any one of claims 9 to 11, wherein pH of the aqueous layer is 7 or more.

13. The method as claimed in claim 12, wherein the pH of the aqueous layer varies from 7 to 9.

14. The method as claimed in any one of claims 9 to 13, wherein the additive is added either along with water or after dissolving in water.

15. The method as claimed in any one of claims 9 to 14, wherein the additive is added in a stoichometric amount or a double stoichometric equivalent to calcium concentration, or in excess of the calcium concentration.