

Claim:

1. A demulsification additive composition, wherein the composition consists of:
 - (a) at least one demulsifier (the component (a)) comprising oxyalkylated alkyl phenol formaldehyde polymer, co-polymer or resin, or oxyalkylated condensation product of at least one alkyl phenol and formaldehyde; ~~and~~
 - (b) a compound selected from the group consisting of glyoxal, neutralized glyoxal, ethylene glycol derivative of glyoxal, and a mixture thereof (the component (b)); and
 - (c) phosphoric acid (the component (c));wherein the demulsifier (component (a)) comprises 50% active nonylphenol formaldehyde ethoxylate resin or a base catalysed nonylphenol formaldehyde resin;
wherein the glyoxal (component (b)) is neutralized with triethanol amine (TEA);
wherein the composition does not comprise:
 - (i) glycolic acid;
 - (ii) glyoxylic Acid;
 - (iii) citric acid; and
 - (iv) maleic anhydride.
2. The demulsification additive composition as claimed in **claim 1**, wherein the neutralized glyoxal is glyoxal having pH neutral to basic varying from about 7 to about 12.
3. The demulsification additive composition as claimed in **claim 1 or 2**, wherein the composition comprises:
 - a) the component (a) in an amount varying from about 99.1 % to about 0.1 % by weight of the total composition;
 - b) the component (b) in an amount varying from about 0.1 % to about 99.1 % by weight of the total composition; and
 - c) the component (c) in an amount varying from about 0.1 % to about 99.1 % by weight of the total composition,depending upon the nature of the water-in-oil emulsion to be treated.

4. The demulsification additive composition as claimed in any one of **claims 1 to 3**, wherein the molecular weight of the demulsifier varies from about 1000 to about 20000 daltons as measured by Gel Permeation Chromatography (GPC) using the tetrahydro furan (THF) as solvent.

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5. A method of demulsification of water-in-oil emulsions comprising a step of treating the water-in-oil emulsion with a demulsification additive composition, wherein the demulsification additive composition comprises:

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- (a) at least one demulsifier (the component (a)) comprising oxyalkylated alkyl phenol formaldehyde polymer, or a co-polymer, a resin, or an oxyalkylated condensation product of at least one alkyl phenol and formaldehyde; ~~and~~
- (b) a compound comprising glyoxal, neutralized glyoxal, ethylene glycol derivative of glyoxal, or a mixture thereof (the component (b)); and
- (c) further comprises a phosphoric acid (the component (c)).

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6. The method as claimed in **claim 5**, wherein the neutralized glyoxal is glyoxal having pH neutral to basic varying from about 7 to about 12.

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7. The method as claimed in **claim 5 or 6**, wherein the demulsifier comprises oxyalkylated condensation product of:

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- i) nonyl phenol and amyl phenol, and formaldehyde;
- ii) nonyl phenol and butyl phenol, and formaldehyde;
- iii) nonyl phenol and formaldehyde;
- iv) amyl phenol and formaldehyde;
- v) butyl phenol and formaldehyde;
- vi) alkyl phenol and formaldehyde; ~~and/or~~
- vii) a mixture thereof.

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8. The method as claimed in any one of **claims 5 to 7**, wherein the demulsifier comprises oxyalkylated condensation product of:

- i) cardanol, nonyl phenol and amyl phenol, and formaldehyde;
- ii) cardanol, nonyl phenol and butyl phenol, and formaldehyde;
- iii) cardanol, nonyl phenol and formaldehyde;
- iv) cardanol, amyl phenol and formaldehyde;

- v) cardanol, butyl phenol and formaldehyde;
- vi) cardanol, alkyl phenol and formaldehyde; ~~and/or~~
- vii) a mixture thereof.

5 9. The method as claimed in any one of **claims 5 to 8**, wherein the said oxyalkylated comprises derivative of ethylene oxide, propylene oxide, or mixture thereof.

10. The method as claimed in any one of **claims 5 to 9**, wherein the demulsifier comprises:

- 10 i) oxyalkylated nonyl phenol and amyl phenol formaldehyde copolymers;
- ii) oxyalkylated nonyl phenol and butyl phenol formaldehyde copolymers;
- iii) oxyalkylated nonyl phenol formaldehyde polymers;
- iv) oxyalkylated amyl phenol formaldehyde polymers;
- v) oxyalkylated butyl phenol formaldehyde polymers;
- 15 vi) oxyalkylated alkyl phenol formaldehyde polymers; ~~and/or~~
- vii) a mixture thereof.

11. The method as claimed in as claimed in any one of **claims 5 to 10**, wherein the demulsifier comprises:

- 20 i) oxyalkylated cardanol, nonyl phenol and amyl phenol, and formaldehyde copolymers;
- ii) oxyalkylated cardanol, nonyl phenol and butyl phenol, and formaldehyde copolymers;
- iii) oxyalkylated cardanol, nonyl phenol and formaldehyde polymers;
- 25 iv) oxyalkylated cardanol, amyl phenol and formaldehyde polymers;
- v) oxyalkylated cardanol, butyl phenol and formaldehyde polymers;
- vi) oxyalkylated cardanol, alkyl phenol and formaldehyde polymers; ~~and/or~~
- vii) a mixture thereof.

30 12. The method as claimed in any one of **claims 5 to 11**, wherein the demulsification additive composition added to the water-in-oil emulsion comprises:

- a) the component (a) in an amount varying from about 99.1 % to about 0.1 % by weight of the total demulsification additive composition;

- b) the component (b) in an amount varying from about 0.1 % to about 99.1 % by weight of the total demulsification additive composition; and
 - c) the component (c) in an amount varying from about 0.1 % to about 99.1 % by weight of the total demulsification additive composition,
- 5 depending upon the nature of the water-in-oil emulsion to be treated.

13 The method as claimed in any one of **claims 5 to 12**, wherein the molecular weight of the demulsifier varies from about 1000 to about 20000 daltons as measured by Gel Permeation Chromatography (GPC) using the tetrahydro furan (THF) as solvent.

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14. The method as claimed in any one of **claims 5 to 13**, wherein the demulsification additive composition does not comprise:

- (i) glycolic acid;
- (ii) glyoxylic Acid;
- (iii) citric acid; and
- (iv) maleic anhydride.

15. A method of using a demulsification additive composition for demulsification of a water-in-oil emulsion, wherein demulsification additive composition is added to the water-in-oil emulsion for demulsification thereof, and wherein the demulsification additive composition comprises:

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- (a) at least one demulsifier (the component (a)) comprising oxyalkylated alkyl phenol formaldehyde polymer, or a co-polymer, a resin, or an oxyalkylated condensation product of at least one alkyl phenol and formaldehyde; and
 - (b) a compound comprising glyoxal, neutralized glyoxal, ethylene glycol derivative of glyoxal, or a mixture thereof (the component (b)); and
 - (c) further comprises a phosphoric acid (the component (c)).
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