CLAIMS

1. A method of preventing formation of a water and oil emulsion in a downhole formation containing oil, the method comprising:

preparing a dispersion of water and a plurality of non-functionalized nanoparticles, each nanoparticle in the plurality of nanoparticles having a size of at least 300 nanometres; and

injecting the mixture downhole into contact with the oil downhole,

in which presence of the plurality of nanoparticles prevents formation of an emulsion between the injected water and the oil.

2. A method according to Claim 1, in which the plurality of non-functionalized nanoparticles comprise silica and have respective surfaces that are free of any surface modification.

3: A method according to Claim 2, in which the respective surfaces of the plurality of non-functionalized nanoparticles lack any chemical groups which modify the surface properties of the silica.

4. A method according to Claim 1, in which the water is distilled, and the plurality of nanoparticles are dispersed in the water at a concentration of approximately 0.2 weight percent.

5. A method according to Claim 1, in which the water contains salt, and the plurality of nanoparticles are dispersed in the water at a concentration of approximately 1.6 weight percent.

6. A method according to Claim 5, in which the water has a salt concentration of up to approximately 3.5 weight percent.

7. A method according to any preceding claim, in which each of the nanoparticles in the plurality of nanoparticles has a size in a range of 300 to 500 nanometres.

8. A composition for use in preventing formation of water and oil emulsions comprising a dispersion of a plurality of non-functionalized silica nanoparticles in salt water, each of the nanoparticles having a size of at least 300 nanometres dispersed in the salt water.

9. A composition according to Claim 8, in which the plurality of nanoparticles are dispersed in the salt water at a concentration of approximately 1.6 weight percent.

10. A composition according to Claim 9, in which the water has a salt concentration of approximately 3.5 weight percent.

11. A composition according to Claim 8, in which each of the nanoparticles in the plurality of nanoparticles has a size in a range of 300 to 500 nanometres.

12. A method of preventing formation of a water and oil emulsion in a downhole formation containing oil, the method comprising:

preparing a dispersion of water and a plurality of nanoparticles, each nanoparticle in the plurality of nanoparticles having a size of at least 300 nanometres; and

injecting the mixture downhole into contact with the oil downhole,

in which presence of the plurality of nanoparticles prevents formation of an emulsion between the injected water and the oil.

13. A method according to Claim 12, in which the plurality of nanoparticles are composed of silica.

14. A method according to Claim 12, in which the water is distilled, and the plurality of nanoparticles are dispersed in the water at a concentration of approximately 0.2 weight percent.

15. A method according to Claim 12, in which the water contains salt, and the plurality of nanoparticles are dispersed in the water at a concentration of approximately 1.6 weight percent.

16. A method according to Claim 15, in which the water has a salt concentration of approximately 3.5 weight percent.

17. A method according to any of Claims 12 to 16, in which each of the nanoparticles in the plurality of nanoparticles has a size in a range of 300 to 500 nanometres.