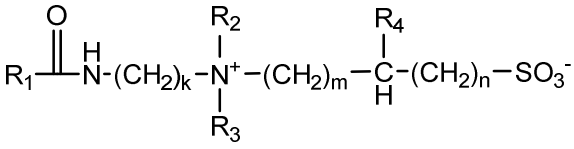
CLAIMS

1. A viscoelastic fluid for a subterranean formation comprising:

viscoelastic surfactant according to the formula (I):



where R_1 is a saturated or unsaturated hydrocarbon group of from 17 carbon atoms to 29 carbon atoms, R_2 and R_3, are each independently selected from a straight chain or branched alkyl or hydroxyalkyl group of from 1 carbon atom to 6 carbon atoms, R_4 is selected from H, hydroxyl, alkyl, or hydroxyalkyl groups of from 1 carbon atom to 4 carbon atoms; k is an integer of from 2-20; m is an integer of from 1-20; and n is an integer of from 0-20;

brine solution; and

at least one nanoparticle viscosity modifier comprising a particle size of 0.1 nanometers to 500 nanometers, or 0.1 nanometers to 100 nanometers, where the at least one nanoparticle viscosity modifier is selected from the group consisting of ZrO_2 nanoparticles, carbon nanotubes, or combinations thereof.

2. The viscoelastic fluid for a subterranean formation according to claim 1, where the at least one viscosity modifier is non-polymeric.

3. The viscoelastic fluid for a subterranean formation according to claim 1, where the viscoelastic surfactant comprises erucamidopropyl hydroxypropylsultaine.

4. The viscoelastic fluid for a subterranean formation according to claim 1, further comprising solvent.

5. The viscoelastic fluid for a subterranean formation according to claim 4, where the solvent is selected from water, alcohol, or combinations thereof.

6. The viscoelastic fluid for a subterranean formation according to claim 5, where the alcohol comprises monohydric alkyloxy, diol, triol or a combination thereof.

7. The viscoelastic fluid for a subterranean formation according to claim 1, where the viscoelastic fluid comprises from 0.5% by weight to 20% by weight of the viscoelastic surfactant.

8. The viscoelastic fluid for a subterranean formation according to claim 1, where the viscoelastic fluid comprises from 1% by weight to 50% by weight of salt in the solution.

9. The viscoelastic fluid for a subterranean formation according to claim 1, where the brine solution comprises one or more metal salts or metal halides.

10. The viscoelastic fluid for a subterranean formation according to claim 1, where the brine solution comprises one or more alkali or alkaline earth metal halides.

11. The viscoelastic fluid for a subterranean formation according to claim 10, where the metal halides comprise calcium chloride, calcium bromide, zinc bromide, or combinations thereof.

12. The viscoelastic fluid for a subterranean formation according to claim 1, where the viscoelastic fluid comprises from 0.001% by weight to 5% by weight of the at least one nanoparticle viscosity modifier.

13. The viscoelastic fluid for a subterranean formation according to claim 1, where the at least one nanoparticle viscosity modifier has a particle size from 10 nanometers to 60 nanometers.

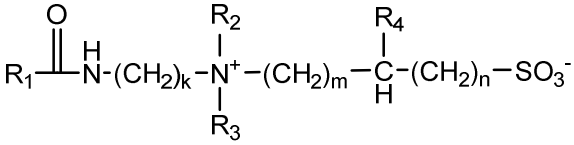
14. The viscoelastic fluid for a subterranean formation according to claim 1, further comprising breaker material.

15. The viscoelastic fluid for a subterranean formation according to claim 1, further comprising at least one additional surfactant.

16. The viscoelastic fluid for a subterranean formation according to claim 1, where the additional surfactant comprises cationic surfactant, anionic surfactant, non-ionic surfactant, amphoteric surfactant, or a combination thereof.

17. A method of treating a subterranean formation penetrated by a wellbore with a viscoelastic fluid comprising:

mixing a viscoelastic surfactant, at least one nanoparticle viscosity modifier, and a brine solution to produce the viscoelastic fluid, the viscoelastic surfactant according to formula (I):



where R_1 is a saturated or unsaturated hydrocarbon group of from 17 carbon atoms to 29 carbon atoms, R_2 and R_3, are each independently selected from a straight chain or branched alkyl or hydroxyalkyl group of from 1 carbon atom to 6 carbon atoms, R_4 is selected from H, hydroxyl, alkyl, or hydroxyalkyl groups of from 1 carbon atom to 4 carbon atoms; k is an integer of from 2-20; m is an integer of from 1-20; and n is an integer of from 0-20; and

the at least one nanoparticle viscosity modifier comprising a particle size of 0.1 nanometers to 500 nanometers, or 0.1 nanometers to 100 nanometers, where the at least one nanoparticle viscosity modifier is selected from the group consisting of ZrO_2 nanoparticles, carbon nanotubes, or combinations thereof; and

introducing the viscoelastic fluid into the subterranean formation through the wellbore, where the treatment fluid is subjected to temperatures greater than 250 °F.

18. The method of treating a subterranean formation penetrated by a wellbore with the viscoelastic fluid according to claim 17, where the treatment fluid is subjected to temperatures greater than 275 °F.