

Article

Anti –bacterial study of polymeric blends for Oil well injection water application

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Abstract

A total of thirty-three polymeric blends (A1-A33) were synthesised using xanthan gum, sodium alginate, carboxymethyl cellulose and polyacrylamide. The antimicrobial efficacy of all the synthesised polymeric blends was assessed against *Staphylococcus aureus*, a strain of gram-positive bacteria and *Escherichia coli*, a strain of gram-negative bacteria. The blends A9 and A12 exhibited antibacterial properties. A9 shown effective activity against both types of bacteria, but A12 exclusively displayed activity against Gram-positive bacteria. The two formulated polymeric blends were combined with varying quantities of *rhamnolipid* (*Rha2-C10-C10*) which are biosurfactants produced from *Pseudomonas aeruginosa*, a gram negative bacterium and evaluated against two strains of bacteria. However, no outcomes were seen. This study found that (*Rha2-C10-C10*) did not exhibit antibacterial properties when mixed with distilled water at lower concentrations. However, it was found to be effective as an antibacterial agent when not diluted with distilled water. Additionally, the study established the lowest concentration of polymer blend and rhamnolipid (*Rha2-C10-C10*) required for antibacterial activity.

Keywords antibacterial, biosurfactants, glycolipids, polymeric blends, Rhamnolipids, water-soluble polymers.