

## Rheological Characteristics of Dispersed Silica Nanoparticles in Low Molecular Weight Polyacrylamide Solution

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### Abstract

Polymer flooding has proved economically and technically successful in numerous enhanced oil recovery projects, which can improve oil recovery of mature reservoirs. Although, polymer solutions are used as mobility control agents in different chemical enhanced oil recovery methods, they are influenced by several degradation factors. Therefore, the improvement of the polymer solution properties is significant for polymer-based enhanced oil recovery methods. In addition, modification of the rheological properties of polymers using nanoparticles can be considered as an open area of research. This paper compares the application of dispersed silica nanoparticles in polyacrylamide solution as viscosifier agent by the use of experimental observations and rheological models. The rheological models are those that have been implemented in the well-known chemical flooding simulator. Results indicate that the effect of dispersed silica nanoparticles on solution viscosity is more predominant when the polymer concentration is high. Moreover, to some extent, dispersed silica nanoparticles reduce the negative effect of salinity on degradation of polymer molecules.

**Keywords:** Polyacrylamide, Silica Nanoparticles, Polymer Flooding.

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