

Abstract Submitted  
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**Linear and non-linear rheological study of long-chained surfactant solutions for gravel packing operations** RODRIGO MITISHITA, RONAK GUPTA, GWYNN ELFRING, Department of Mechanical Engineering, University of British Columbia, IAN FRIGAARD, Departments of Mechanical Engineering and Mathematics, University of British Columbia — Long chained zwitterionic surfactants are extensively used in the oil industry, such as fracturing and gravel packing operations. Specifically in the context of gravel packing, the surfactant solutions need high viscosities over a wide range of shear rates and temperatures to successfully carry the gravel particles. The surfactant fluids are also drag-reducing due to their viscoelasticity, which aids in the transport over long distances at high pumping rates. In this study, we characterize a commercial surfactant for gravel packing by carrying out linear and non-linear rheology experiments. We show that the surfactant+water system exhibits a gel-sol transition with temperature. The results also quantify how the relaxation time of the solution and elastic modulus of the gel state depend on surfactant concentration and temperature. Finally, we discuss implications of rheology on gravel packing and turbulent drag reduction.

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