Title of Article: Poly (AM-*co*-*N*-DDAM): Investigating the Effects of Shear, Temperature and Salinity for Enhanced Oil Recovery Application.

Author: Richard O. Afolabi

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Abstract: Polymer degradation is an important challenge associated with polymer flooding operations during Enhanced Oil Recovery (EOR). Non-associating polymers lose their viscosity under harsh reservoir conditions such as high temperature and salinity. This makes for an inefficient recovery process under such conditions. Polyacrylamide based associating polymers has been an area of ongoing research as the use of different hydrophobic co-monomers with acrylamide monomers yields associating polymers with improved rheological properties. In this paper, an associating polymer made up of acrylamide (AM) and *N*-dodecylacrylamide (*N*-DDAM) was synthesized via micellar copolymerization with the amount of *N*-dodecylacrylamide co-monomer varied for each synthesized polymers. The characterization of the synthesized polymer was carried out through viscometric measurement using an Ubbelohde Viscometer to determine the molecular weight of the polymers. The rheological behavior of the polymers under shear stress, temperature and salinity was investigated using a Bohlin Rheometer. Improved rheological properties were observed with increasing amount of the *N*-dodecylacrylamide co-monomer. The effect of the *N*-dodecylacrylamide content can be seen in the improved resistance to salinity, shear and temperature comparable with most hostile environments of oil reservoirs. These enhanced polymeric properties turn out to be more evident when the *N*-dodecylacrylamide content increases which leads to larger hydrophobic blocks on the polymer backbone. The presence of these *N*-dodecylacrylamide blocks on the polymer backbone increases its molecular weight thereby improving its viscous property