

Synthesis, Characterization and Solution Properties of Hydrophobically Modified Poly(vinyl alcohol)

Prof. SHAIKH ASROF ALI

**Dept. of Chemistry , College of Science ,
King Fahd University of Petroleum & Minerals**

<http://www.kfupm.edu.s>

ABSTRACT

A series of hydrophobically modified water-sol. poly(vinyl alc.) (PVA) polymers were prepd. by grafting urethanized PVA with varying fractions of fatty acid chlorides of various chain lengths. The objective of the synthesis was to prep. polymers that can be applied to enhanced oil recovery. The soln. viscosity was investigated as a function of polymer concn., temp., shear rate, and salinity. Furthermore, the surface and decane-water interfacial tensions were investigated with respect to polymer and salt concns. Micelle formation was probed by measuring pyrene fluorescence as a function of polymer concn. The soln. viscosity was enhanced by the hydrophobic modification, compared with the unmodified PVA as a result of hydrophobic assocn. The viscosity of a 3% polymer soln. decreased with increasing salt concn. from 0.0 to 6.0 wt %, above which some polymer pptd. from the soln. The soln. viscosity decreased with both temp. and shear rate. Pyrene fluorescence measurements showed that hydrophobic micelles formed above a polymer concn. of 0.5%. The micelle formation was relatively insensitive to salt concn. The surface tension decreased sharply with increasing polymer concn. to reach a min. at a polymer concn. of 0.15% and then increased gradually up to a polymer concn. of 3%. Interfacial tension with n-decane showed a continuous decrease with polymer concn.