

Synthesis and viscosity behavior of hydrophobically modified poly(vinyl (alcohol) (PVA

Prof. SHAIKH ASROF ALI

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

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

ABSTRACT

A novel series of water-sol. hydrophobically modified poly(vinyl alc.) (PVA) is prepd. by chem. modification of PVA, with the objective of investigating the polymer's rheol. behavior for enhanced oil recovery applications. The soln. viscosity of the polymer obtained is studied with respect to the polymer concn., temp., salinity, polymer modification, aging, shear rate, and polymer mol. wt. The soln. viscosity of the PVA is greatly enhanced by the modification. The modified PVA exhibits a relatively high salt tolerance, typical of nonionic polymers, in the range of 0-7.0 wt.% NaCl concns., and the viscosity of the polymer soln. is relatively invariant with NaCl above 3.0 wt.% NaCl concn. Below 3 wt.%, the viscosity shows a max. then a min., an unusual behavior. Generally, the polymer exhibits an almost const. viscosity at high shear rates and a typical shear thinning behavior at low shear rates. In addn., increasing polymer concn. and mol. wt. leads to an increase in the polymer soln. viscosity. Moreover, the polymer exhibits smaller soln. viscosity at a high temp., and a slight decrease in viscosity is also exhibited by the modified polymer with aging. Comparison of the viscosities of 18 polymer modifications indicates that the larger the nos. of hydrophobic groups (side chains) in the polymer structure, the smaller the viscosity. Moreover, the longer the hydrophobic groups (side chains) in the polymer structure, the greater the viscosity, if their no. is small.