Solution and Interfacial Behavior of Hydrophobically Modified Water-soluble Block Copolymers of Acrylamide and N-Phenethylacylamide

Prof. SHAIKH ASROF ALI

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

http://www.kfupm.edu.s

ABSTRACT

Hydrophobically modified water-sol. block copolymers were prepd. by aq. micellar copolymn. of acrylamide and small amts. (2 and 3 mol%) of a hydrophobe (N-phenethylacrylamide) that is characterized by a long spacer that places the arom. ring far away from the backbone, with the objective of investigating the copolymers' rheol. behavior and surface and interfacial activities under various conditions such as polymer concn., shear rate, temp., and salinity. As expected, the block copolymers exhibit improved thickening properties attributed to intermol. hydrophobic assocns. as the soln. viscosity of the copolymers increases sharply with increasing polymer concn. Addnl. evidence for intermol. assocn. is provided by the effect of NaCl, the presence of which substantially enhances the viscosity. An almost shear rate-independent viscosity (Newtonian plateau) is also exhibited at high shear rate and a typical non-Newtonian shear thinning behavior appears at low shear rates and high temps. Furthermore, the block copolymers exhibit high air-liq. surface and liq.-liq. interfacial activities as the surface and interfacial tensions decrease with increasing polymer concn., indicating strong adsorption of the copolymer at the interface. The surface and interfacial tensions exhibited by the copolymers were found to be relatively insensitive to the concn. of salt (NaCl).