RHEOLOGICAL AND OPTICAL PROPERTIES OF MIXTURES OF AMPHOLYTE AND FATTY ALCOHOL

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ABSTRACT

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Structure and rheological properties of amphoteric surfactant-fatty alcohol mixtures, or emulsions, were investigated in terms of aging time, concentration, temperature and pH. Aging allowed a growth of the dispersed particles toward their equilibrium sizes after a period of 14 days. High concentrations of fatty alcohol induced the dispersed particles to aggregate. Both entanglement modulus and zero shear viscosity increased with fatty alcohol content until reaching their saturation values at which there was excess fatty alcohol. The increase in temperature above room temperature caused the emulsions to disaggregate. Zero shear viscosity and Bingham stress decreased with increasing temperature. However, an increase in temperature did not affect the storage entanglement modulus of the emulsions at high fatty alcohol concentrations. The amphoteric surfactant can be strongly influenced by pH effect. Entanglement modulus, zero shear viscosity and Bingham stress turned up the highest values at the isoelectric area of the surfactant molecules. Entanglement modulus, zero shear viscosity and Bingham stress decreased beyond the isoelectric regime due to hydrophilic repulsion between the surfactant molecules.

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