RHEOLOGICAL BEHAVIOR OF THE CETYLTRIMETHYLAMMONIUM FLUOROBENZONATE/H2O SYSTEM IN THE DILUTED REGIME

G. Landazuri, E.R. Macias, V.V.A. Fernandez, J.F.A. Soltero

Universidad de Guadalajara

jfasm@hotmail.com

Flow can promote structural modifications and growth and induce phase transitions in micellar solutions such as shear thickening at relatively low concentrations. The shear thickening transition (STT) in dilute surfactant solutions is characterized by a large viscosity increase when the micellar solution is sheared above a critical shear rate due to the formation of shear-induced structures (SIS). Here we report the rheological behavior of the cetyltrimethylammonium fluorobenzonate/H_2O system in the diluted regime at different fluorobenzoate counterion positions (ortho, meta and para) and concentration. Transient and Steady simple-shear experiments were performed in a TA Instruments ARG2 rotational stress controlled rheometer with cone-plate geometry (60 mm in diameter and 2°). The results showed that the STT occurs at concentrations where cylindrical micelles locally exist. The intensity of shear thickening follows the order: meta-fluorobenzoate > para- fluorobenzoate > ortho-fluorobenzoate. The explanation to this behavior could be that the strength of micellar binding of the counterion (i.e., its hydrophobicity) controls the micellar growing.