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ANALYTICAL RESULTS OF CAPILLARY RHEOMETRY OF MICELLAR AQUEOUS SOLUTIONS

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In this work, the theory of capillary flow of a wormlike micellar solutions was studied in detail. In order to describe the flow is used the Rabinowitch-Weissenberg equation to calculate the viscosity curve. The complex flow behavior is analyzed with the Bautista-Manero-Puig model (BMP) constitutive equation, consisting in the Upper Convected Maxwell equation coupled to a kinetic equation to account for the breakdown and reformation of the fluid structure. Analytical expression are found, that predict capillary flow of a complex liquid in a capillar channel, and the wall apparent viscosity. This equation can account for the wall slip condition. It was found that the flow is analyzed trough dimensionless characteristic numbers which describe the effects of the kinetic, structural and thixotropy effects. Finally, capillary flow of worm like micellar solutions is predicted using experimental data reported elsewhere for wormlike micellar solutions of cetyl trimethyl ammonium tosilate at various sample concentrations [1-3].