

Influence of Drop Growth Rate and Size on the IFT of Triton X-100 Solutions Varying Pressure and Temperature

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Interfacial Tension (IFT) between decane and aqueous solutions of Triton X-100 (Octyl phenol ethoxylate) was determined by the pendant drop technique and the effects of the temperature, pressure, surfactant concentration, droplet growth rate and size were studied. Three aqueous solutions of surfactant were used (0.48E-4mol/L, 0.96E-4mol/L, 1.43E-4 mol/L) and the experiments were performed at 2, 3 and 4 MPa and at 30, 40 and 50°C. As expected, the alkane drop changed its shape and the IFT of the system decreased as the surfactant adsorbed onto the interface, until the drop finally separates from the capillary, in a maximum time of 2120 s. According with the results, the influence of temperature on the IFT is inversely proportional to the surfactant concentration, because when the concentration increases, the temperature has little effect on it. It was also noticed that the effect of pressure on the IFT at lower surfactant concentrations is less significant than at higher concentrations. While the temperature decreases, the pressure reduces its effect on the IFT, as occurs with systems at 30°C. The droplet growth rate does not affect significantly the IFT value, while its size does, therefore; when transient studies are carried out; it is required to control the drop size.