# RHEOLOGY AND MORPHOLOGY OF IMMISCIBLE POLYMER BLENDS: EFFECTS OF ADDED PARTICLES

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In this study, the effect of micron-sized hydrophobic calcium carbonate particles with two different particle sizes on the stabilization of Polydimethylsiloxane (PDMS) / Polyisobutylene (PIB) blends, were investigated. The presence of particles at the fluid-fluid interface was supported by wetting parameter calculation and verified by optical microscopy observations. Moreover, direct visualizations showed that the particles are able to form clusters of droplets by simultaneously adsorbing two fluid-fluid interfaces and glue dispersed droplets together. These particle-bridged droplet clusters lead to a plateau in storage modulus and an upturn in complex viscosity in the low frequency region during frequency sweep experiment. In this study besides frequency sweep measurements, the recovery and stress relaxation experiments have been performed to investigate the effect of particles on the flow-induced coalescence phenomenon in this blend system. It was found that upon the addition of particles, flow induced coalescence was slowed down and with addition of 4 w% particles this phenomenon was almost suppressed. This effect became more obvious when the particle size was reduced. Palierne emulsion model is applied to predict the rheological behavior of unfilled blends. For filled blends a combination of Palierne and Coussot models based on a linear mixing rule has been used to consider the effect of particle-bridged droplet clusters on the rheological behavior. Furthermore, the nonlinear viscoelastic behavior of different containing particle blends was investigated in different shear rate by transient start-up of shear flow.