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# RHEOLOGY AND MORPHOLOGY OF PARTICLE CONTAINING IMMISCIBLE POLYMER BLENDS

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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 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. Stress relaxation experiments under quiescent conditions showed that the bridging is more effective than the coalescence which suggests that the rheology of this system has been controlled by the droplet clusters rather than the interfacial energy of individual droplets. The deviation of blend system behavior from conventional Palierne's model towards Goharpey's model - which is a modification of Palierne's model by considering the aggregation of dispersed phase - suggested the application of aggregation models such as Yziquel's model for this system. Finally, a good agreement of Yziquel's model with the rheological behavior of particle containing blend sample was observed.