Morphology and rheology of cocontinuous blends

Microstructure was related to viscoelastic properties of cocontinuous polymer blends during coarsening. Fluorescently labeled polystyrene (FLPS) and styrene-acrylonitrile copolymer (SAN) were imaged with laser scanning confocal microscopy (LSCM). Images were analyzed for time evolution of interfacial area, curvature and curvature distributions. Different regimes of coarsening were observed depending on the composition of the blend. For symmetrical blends a single regime was observed: self-similar growth. In the case of non-symmetrical blends the self-similar growth was followed by a slowing down of the coarsening and a subsequent transition to disperse morphologies (pinch-off) after sufficient annealing. These transitions were detected and quantified by measurements of the extra contribution to the elastic modulus due to the interface.