

Particle-induced bridging of droplets in polypropylene/poly(caprolactone)/carbon black composites

김지환, 홍정숙, 안경현[†]
서울대학교
(ahnnet@snu.ac.kr[†])

In this study, particle-induced bridging of droplets constructed in polypropylene/poly(caprolactone)/carbon black composites was investigated through their morphology, electrical and rheological properties to determine how localization of particles affects the morphology development in immiscible polymer blends. Results of the electrical measurement indicated that the conductivity of a blend with 40 wt% PCL and 3 wt% CB, called PP/PCL40/CB3, was 10^5 order of magnitude higher than that of PP/PCL30/CB3. SEM images of blends revealed that CB particles located at interface, on the PCL surface, between two polymers and also dispersed in thermodynamically favored PCL bridge two PCL droplets large enough to contact each other in PP/PCL40/CB3. But no coalescence of droplets takes place due to low deformability of PCL which results from particles in PCL. At that condition interfacial CB particles formed conducting pathway through surface of each droplet. For dynamic rheological testing, reduction of terminal slope at low frequency region resulted from particle-induced bridged structure.