

The effect of molecular structure of formed copolymer on morphological changes at polymer-polymer interface

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In this study we investigated the effect of molecular structure of formed copolymer on morphological changes at reactive polymer-polymer interface.

The blend systems employed in this study was glycidyl methacrylate terminated polystyrene (PS-GMA) and an carboxylated poly(methyl methacrylate) (PMMA-COOH). All samples were synthesized by an anionic polymerization. In order to get various molecular structure of formed copolymer, we synthesized three kind of PMMA-COOH with different position of carboxylate group - middle, a third and end of chain. We prepared the film, PS-GMA/PMMA-COOH/Si-wafer by sequential spin-casting. We make the reaction occur at 180oC for 32 hrs. We observed the interface by AFM after removal of PS by selective solvent rinsing. And we examined the presence of microemulsion or micelle by TEM study.

Through the observation of the interface, we found the effect of molecular structure of formed copolymer on reaction and morphological change at polymer-polymer interface. We found that the Y-shape of formed copolymer helped the interface to generate more than diblock shape. We also found the presence of microemulsion or micelle is related to the molecular structure of formed copolymer.