

Abstract Submitted  
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**Compatibilization of Immiscible Polymer Blends via Gradient Copolymer Addition during Melt Processing: Stabilization of the Dispersed Phase against Coarsening** JUNGKI KIM, MAISHA K. GRAY, Northwestern University, JOHN M. TORKELSON, Northwestern University, Evanston, IL 60208-3120 — The first compatibilization an immiscible polymer blend by addition of gradient copolymer during melt processing is demonstrated by complete suppression of coarsening during annealing. As compared to block copolymer addition, this strategy has the advantage of much higher theoretical critical micelle concentrations, making gradient copolymer more available to locate at blend interfaces. Compatibilization was achieved in an 80/20wt% polystyrene (PS)/poly(methyl methacrylate) blend upon addition of 5wt% gradient copolymer (59/41mol% styrene (S)/methyl methacrylate (MMA)) made by controlled radical polymerization. In contrast, a blend made with 5wt% of a S/MMA random copolymer of identical overall composition as the gradient copolymer exhibited coarsening as did a blend with no copolymer. The success of this novel compatibilization strategy depends on the gradient copolymer composition and the blend incompatibility.

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