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Phase Behavior of Star-shaped polystyrene-*block*-poly(methyl methacrylate) Copolymers SANGSHIN JANG, HONGCHUL MOON, YOUNG-MIN LEE, JIN KON KIM, Department of Chemical Engineering, Pohang University of Science and Technology — Star-shaped polystyrene-*block*-poly(methyl methacrylate) copolymer (PS-*b*-PMMA) was synthesized by utilizing α -cyclodextrin (α -CD) as a junction point of the star-shaped block copolymer. Eighteen hydroxyl groups on α -CD were substituted with bromine by the reaction with α -bromoisobutyryl bromide for atom transfer radical polymerization. We found that the number of bromine substituted arms per one α -CD was higher than 16 measured by nuclear magnetic resonance and Matrix-assisted laser desorption/ionization. We could control molecular weight of this unusual kind of block copolymer depending on polymerization times. Those polymers were characterized by gel permeation chromatography and nuclear magnetic resonance. Phase behavior of these star-shaped block copolymers were investigated.

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