

Micellization behavior of Star-shaped Polystyrene-block-poly(2-vinyl pyridine) Copolymer

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We synthesized star-shaped polystyrene-block-poly(2-vinyl pyridine) copolymer (PS-b-P2VP) by utilizing α -cyclodextrin (α -CD) as a junction point of the star shape. For this purpose, 18 hydroxyl groups on α -CD were replaced with bromine groups by the reaction with α -bromoisobutyryl bromide (BIBB). These brominated groups were used as the initiation site of atom transfer radical polymerization (ATRP) for PS and P2VP. The expected molecular structure is that 18 PS-b-P2VP chains are attached to one α -CD. We characterized that the number of block polymer-linked arms per one α -CD is higher than 16 measure by nuclear magnetic resonance(NMR) and Matrix-assisted laser desorption/ionization(MALDI). The morphologies of this block copolymer are also investigated.