

Synthesis and characterization of star-shaped PMMA-*b*-PS copolymer with discotic π -stacking feasible core박소영, 김진곤^{1,†}POSTECH; ¹POSTECH 화학공학과(iamsy12@postech.ac.kr[†])

The reduction of domain sizes of block copolymer thin films has attracted much attention. Especially, PS-*b*-PMMA is widely used in thin films. Total segment number (N) is one of the factor that can control the self-assembly of block copolymer. It is possible to create small domain sizes by decreasing the N of a block copolymer. However, the incompatibility between two blocks is too weak for microphase separation when N is too small.

Here, we are trying to make the block copolymer which has a propensity to form columnar structures via π -stacking interactions. Star-shaped PMMA-*b*-PS will be synthesized by using Hexa-peri-hexabenzocoronenes (HBCs) as a core of the star-shape. For this purpose, 6 hydroxyl groups on HBCs will be replaced with bromine groups that is the initiation site of ATRP for PMMA and PS. The expected molecular structure is that 6 PMMA-*b*-PS chains are attached to one HBCs. We characterized that HBCs by NMR and MALDI-TOF. The morphologies of this block copolymer will be investigated. By using HBCs as a core of star-shaped block copolymers, we can reduce the feature sizes with small total segment number without macrophase separation.