عنوان مقاله:

THE EFFECT OF SOLVENT ON SELF-ASSEMBLY OF THE PDMS BLOCK COPOLYMER

محل انتشار:

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خلاصه مقاله:

Recent advances in development of controlled polymerization techniques have enabled preparation of block copolymers with new self-assembly structures. In this paper we have investigated the effect of solvent on self-assembly behavior of poly(ethyl methacrylate)-poly(dimethyl siloxane)-poly(ethyl methacrylate)(PEMA-b-PDMS-b-PEMA) block copolymer. The PEMA-b-PDMS-b-PEMA triblock copolymer was synthesized via atom transfer radical polymerization (ATRP) technique which is new in controlled polymerization techniques. The molecular weight and polydispersity index (PDI) of the synthesized block copolymer were measured using gel permeation chromatography (GPC) technique. The intrinsic viscosity of synthesized block copolymer was measured by Ubbelhode viscometer using three solvents including toluene, acetone and dichloromethane. Viscosity of the PDMS block copolymer was obtained using Huggins, Kraemer, and the Martin and Schulz-Blaschke methods. The UV absorption spectra of the synthesized block copolymer was also measured in three solvents. The results from viscosity measurement and UV absorption of the PDMS block copolymer were used to confirm the effect of solvent on self-assembly of the synthesized block copolymer. The investigations on effect of solvent on self-assembly of PEMA-b-PDMS-b-PEMA triblock copolymer was continued by studying the self-organized morphology of this block copolymer via atomic force microscopy (AFM) technique. The results were showed that the nature of solvent affect the self-assembly and consequently the self-organized morphology of PEMA-b-PDMS-b-PEMA triblock copolymer.

کلمات کلیدی:

Self-assembly, Block Copolymer, Solution, Controlled radical polymerization technique, Viscosity