Temperature-Sensitive Shape Memory Polymers based on polyhedral oligomeric silesquioxane and Low Molecular Weight Polyethylene glycols

박한음, 박주현†
중앙대학교
(jpark@cau.ac.kr†)

Shape memory polymers (SMPs) that can sensitively response to external environment stimulus such as temperature have been highlighted mainly for carrier materials in biomedical applications of drug delivery. In this study, we focus on extending the applications of SMPs to smart fibers which can expand or contract depending on surrounding temperature variation. We synthesize temperature-sensitive SMPs based on polyhedral oligomeric silesquioxane (POSS) and low molecular weight polyethylene glycols (PEGs) to make intelligent fiber. Resulting POSS-PEGs show sharp melting transitions because of well-defined molecular structures by combination between POSS and PEGs with low polydispersity index. We characterize the successful synthesis of SMPs by FT-IR and 1-H NMR analysis and further analyze mechanical properties of SMPs by DSC and DMA.