Title : Shape Memory Behavior of Biodegradable PLC and PLEG Copolymers

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ABSTRACT

Biodegradable shape memory polymers (SMPs) have attracted significant attention for biomedical and smart material applications. In this study, poly(L-lactide-*co*-***ε***-caprolactone) (PLC) with a L-lactide/ caprolactone ratio of 70/30 and L-lactide/poly(ethylene glycol) (PLEG) copolymers with two composition ratios (80/20 and 70/30) were synthesized and investigated for their thermally triggered shape memory behavior. The prepared copolymers were fabricated into ball-shaped structures to evaluate their shape fixing and shape recovery performance. Thermal and mechanical properties of the copolymers were analyzed to understand the effect of monomer composition on shape memory performance. The PLC and PLEG samples will be characterized their reversible deformation and recovery by heating above their transition temperatures. Differences in recovery efficiency and structural stability will be elucidated depending on copolymer composition to indicate whether the ratio of hard and soft segments plays an important role in controlling shape memory properties. The obtained results will demonstrate the potential of the biodegradable PLC and PLEG copolymers for functioning as smart SMP materials in biomedical applications.

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