

Triple-shape memory effects of peroxide crosslinked 1,2-polybutadiene and trans-polycyclooctene rubber blends

김성진, Muhammad Kashif, 장영욱^{1,†}
한양대학교; ¹한양대학교 재료화학공학과
(ywchang@hanyang.ac.kr[†])

Multiphase semicrystalline triple-shape memory polymers were prepared by melt blending and peroxide crosslinking of 1,2-polybutadiene (PBD) and trans-polycyclooctene rubber (TOR) blends. The effect of dicumyl peroxide (DCP) content on the mechanical, thermal and thermomechanical properties of the blends was investigated. Mechanical properties of the blends improved with the addition of DCP in the blends. Dynamic mechanical analysis results revealed drop in storage modulus at two different transitions corresponding to melting temperature of PBD and TOR and a presence of the plateau above the melting temperatures of these phases. Moreover, triple-shape memory behavior was observed in the peroxide crosslinked blends. Two different temporary shapes can be programmed above melting temperatures of each phase and then step-wise recovery of each phase upon heating.