

Thermomechanical Properties of Carboxylated Telechelic Poly(ϵ -Caprolactone)/Epoxidized Natural Rubber/Organoclay Nanocomposites for Shape Memory Applications

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In this study, we prepared and characterized a network showing shape memory effects from the self-crosslinkable blends of crystallizable carboxylated telechelic polycaprolactone (XPCL) and epoxidized natural rubber (ENR). In order to enhance mechanical properties of the blends, layered silicate were added. The hybrid nanocomposites were synthesized by a solvent casting and a subsequent molding at 180°C. Microstructure of the nanocomposites is characterized by X-ray diffraction (XRD) and transmission electron microscopy (TEM). Melting and crystallization behavior and variation of storage modulus with temperature of the nanocomposites were examined using differential scanning calorimeter (DSC) and dynamic mechanical analyzer (DMA), respectively. Also, the shape memory effects and the recovery force of the nanocomposites were measured.