Shape Memory Polymers and Polymer Nanocomposites

This research program was initiated after a gap was identified between shape memory polymer research activities in US and existing demands for smart materials in industry. The objective is to develop fundamental understanding of shape memory properties of polymer and polymer nanocomposite materials in efforts to obtain a factor of 2-3 increases in shape recovery stress. Such increases in shape recovery stress will qualify polyurethane based shape memory polymers as implants (against ~5 MPa compressive stress of body tissues) and in smart fabrics. Two approaches are followed in our research (1) introduction of functionalized nanoparticles in rod, disc, and spherical shapes and (2) formation of phase-separated domains of de1-5(ns)-32

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