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Anisotropic Magnetic and Mechanical Properties of Epoxy Reinforced with Magnetic Nanofillers OLGA MALKINA, KOREY D. SORGE, HASSAN MAHFUZ, Florida Atlantic University — Polymer nanocomposites have attracted much attention due to the unique properties introduced by nanofillers. Nanocomposites with different physical attributes and organized appropriately are shown to enhance the physical characteristics of the polymer matrix. Numerous studies have been performed on polymers with non-magnetic nanofillers that were subjected to high uniform magnetic fields during the curing stages—leading to enhancements in various properties. Reinforcing an SC-15 epoxy matrix with magnetically active nanoparticles may then show similar enhancement in some behavior with significantly lower applied fields. In this investigation, a combination of Fe_2O_3 nanoparticles and chemically functionalized carbon nanotubes are used. The applied field drives the Fe_2O_3 particles to align in chain-like structures along the field direction and orient the nanotubes. The anisotropy in the system that is introduced in the curing process will allow for analysis of the anisotropy of magnetic, structural and physical properties in the resultant nanocomposites.

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