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Dynamic mechanical properties of hydroxyapatite/polyethylene oxide nanocomposites: characterizing isotropic and post-processing microstructures MEISHA SHOFNER, JI HOON LEE, Georgia Institute of Technology — Compatible component interfaces in polymer nanocomposites can be used to facilitate a dispersed morphology and improved physical properties as has been shown extensively in experimental results concerning amorphous matrix nanocomposites. In this research, a block copolymer compatibilized interface is employed in a semi-crystalline matrix to prevent large scale nanoparticle clustering and enable microstructure construction with post-processing drawing. The specific materials used are hydroxyapatite nanoparticles coated with a polyethylene oxide-b-polymethacrylic acid block copolymer and a polyethylene oxide matrix. Two particle shapes are used: spherical and needle-shaped. Characterization of the dynamic mechanical properties indicated that the two nanoparticle systems provided similar levels of reinforcement to the matrix. For the needle-shaped nanoparticles, the post-processing step increased matrix crystallinity and changed the thermomechanical reinforcement trends. These results will be used to further refine the post-processing parameters to achieve a nanocomposite microstructure with triangulated arrays of nanoparticles.

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