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Nanoparticle Surface Functionalization for Improved Dispersion in Network Composites ADAM RICHARDSON, OLIVIA MCNAIR, GREGORY STRANGE, MARK EARLY, DANIEL SAVIN, School of Polymers and High Performance Materials, University of Southern Mississippi — Incorporation of inorganic nanoparticles into crosslinked networks has resulted in greater toughening behavior with lower filler content compared to traditional composites. The characteristics that provide these desirable qualities are also responsible for their poor dispersion and, consequently, limiting wide commercial use. This work aims to demonstrate how excellent dispersion can be obtained easily and efficiently in different networks through nanoparticle surface modification. Both epoxy/Jeffamine and thiol-ene based networks were examined with differing molecular weight and chemical functionality tethers. The aggregation behavior of nanocomposite samples were monitored optically and using TEM. Thermomechanical properties were studied using DSC, DMA and MTS. The Tg was dependent on both nanoparticle incorporation and functionality. Toughening was observed in some, but not all, cases.

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