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Fabrication and Characterization of Waterborne Multi-wall Carbon Nanotube Paints HEATHER DOWTY, MAX ALEXANDER, Air Force Research Laboratory, CHYI-SHAN WANG, WILLIAM CLICK, MARLENE HOUTZ, JACQUE HENES, HILMAR KOERNER, University of Dayton Research Institute — The fabrication of water-borne polyurethane nanocomposites containing multiwall nanotubes has presented a significant technological challenge to those in the polymer community. Such conductive polyure hanes are of great interest to the paint and coatings industry for use in electrical grounding and shielding. Currently, these materials are formed by strong acidic reflux of the nanotubes and subsequent dispersal in the polymer matrix. This treatment can result in significant shortening of the tubes and degradation of the resulting mechanical and electrical transport properties. Here we present an alternate technique in which various conductive and non-conductive water-soluble polymers are physi-adsorbed to the surface of the nanotube. These interactions with the nanotubes result in highly uniform suspensions of water-based urethane coatings and bulk materials. We will examine the polymer chemistry and morphologies of these nanostructured materials and the resulting thermal, electrical and mechanical properties.

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