

Abstract Submitted
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Electrical Percolation in Polymer Nanocomposites of Nickel and Iron Nanostrands GEORGE HANSEN, MATT PETTIT, Metal Matrix Composites, MAX ALEXANDER, BRANDON BLACK, HEATHER DOWTY, Air Force Research Lab, AIR FORCE RESEARCH LAB TEAM, METAL MATRIX COMPOSITES TEAM — Nickel and Iron nanostrands are elemental nickel nanoparticles on the same length scale of multiwall carbon nanotubes with diameters ranging from 50nm to 500nm typically depending on growth conditions; with an aspect ratio greater than forty. We present data on the fabrication of the nickel and iron nanostrands via thermal decomposition and the corresponding electrical behavior of polymer nanocomposites made from these materials. The concentration of the nanostrands in the polymer was varied as was the method of loading into the polymer to determine the effect on the percolation threshold. The electrical properties of the nanocomposites were characterized by four probe dc conductivity as well as microwave spectroscopy. The Electromagnetic Interference Shielding Effectiveness (EMI SE) is also reported for these materials and can be correlated to the morphology in these systems based on mixing technique.

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