

MULTI-WALLED CARBON NANOTUBE – POLYVINYL CHLORIDE COMPOSITES FOR FLEXIBLE CONDUCTIVE TRACES.

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Multi-walled carbon nanotubes (MWNTs) produced by injection chemical vapor deposition (CVD) were incorporated with polyvinyl chloride (PVC) to produce electrically conductive polymer inks to be used as robust electrical traces. MWNTs were dispersed (5-40 wt%, 5% intervals) into multiple concentrations (1-4 wt%) PVC/N,N-dimethylformamide using sonication and mechanical stirring. The inks were dispensed on PVC tubes using the Micropen®, a direct writing method for patterning materials with high precision (www.OhmCraft.com). The composites were dried using thermal and vacuum methods; resistance was measured using 4 point probe techniques. The MWNT-PVC composites were subjected to mechanical bending (6 to 20 cm radius), and change in resistance was measured. The performance of such composites as compared to traditional metal-doped analogues is discussed.

Alex Sojda is from Oriskany, NY and will be entering his third year in the Electrical Engineering program. This is his first year in the NanoPower Research Laboratory with interests in the utilization of electrical properties of carbon nanotubes in conductive composites, fuel cells and photovoltaic cells. Alex is a member of the RIT Multi-Disciplinary Robotics Club (MDRC) and an active member of the team competing in the Intelligent Ground Vehicle Competition (IGVC). His other interests are control systems and device physics. Alex hopes to attend graduate school and work in research and development.