

Electrical properties of carbon nanotube sheets fabricated  
by inkjet printing

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Carbon nanotubes (CNTs) have a number of potential applications in electronic and display devices. A significant benefit of using nanocarbon electronics is that they can be solution processed using relatively low cost printing, spray, or dip-coating manufacturing technologies.

In order to produce a highly conductive network, it is preferential to avoid additives to a nanotube ink because these will prevent nanotube to nanotube contact after drying, increasing the film resistance. In this study we used acid treatment method to prepare aqueous CNTs inks at a concentration of ~1 wt% for multiwall CNTs (MWNTs) and ~0.25 wt% for single wall CNTs (SWNTs).

CNTs sheets on glasses were fabricated by piezoelectric drop-on-demand inkjet printing with substrate temperature 60-70 °C to minimize coffee staining. The optical transmittance and sheet resistance of the sheets were measured. SWNTs showed much better electrical properties than MWNTs in terms of optical transmission and electrical resistance with over 70% optical transmission and ~1800  $\Omega$ /square.

The impedance of SWNTs sheets in 4 M NaCl solution were also investigated.