Abstract Submitted
for the DFD14 Meeting of
The American Physical Society

Elastocapillary assembly of silver nanotube forest XIN YANG, MIN PACK, YING SUN, Drexel University — Nanorods/nanotubes have large surface areas making them promising for applications such as high-performance battery and capacitor electrodes, photovoltaics, and interconnects. In this study, we demonstrate the formation of 3D microarchitectures via elastocapillary self-assembly of silver nanotube forests. Patterned silver nanotube forests of different lengths and diameters are made by inkjet printing of silver nanoinks into nanoporous anodic aluminum oxide membranes. These silver nanotube forests are then self-assembled into ordered microstructures via capillary forces induced by liquid condensation, which is compared with immersing nanotubes directly into a liquid. The effects of length, diameter, and footprint of the nanotube forest on self-assembled patterns are systematically studied. By decreasing the footprint and/or increasing the length of nanotube forest, the stiffness of the nanotube forest decreases, bringing the nanotubes together to form closely packed microstructures.

Xin Yang
Drexel University

Date submitted: 31 Jul 2014 Electronic form version 1.4