

Abstract Submitted
for the MAR11 Meeting of
The American Physical Society

Low Temperature Study of the Electrical Properties of Sb-SnO₂ Nanofibers¹ MARITZA REYNA, IDALIA RAMOS, NICHOLAS PINTO, University of Puerto Rico at Humacao — Antimony-doped tin oxide (ATO) can be used for many applications including the development of gas sensors, energy storage devices, and transparent electrodes. ATO nanofibers with sizes from 200 - 600 nm and a bandgap of 4.4 e.V were produced using the electrospinning method. The precursor was composed of tin chloride solution mixed with cellulose acetate solution and antimonium chloride. The XRD spectra of the nanofibers showed the characteristic peaks of Sb:SnO₂ with rutile structure. The electrical properties of single ATO nanofibers were studied following a cycle of cooling from 295 - 15 K and then heating from 15 - 295 K. These measurements were done in cold finger (close cycle helium refrigerator) in a vacuum. The conductivity measured at room temperature was 4.3 S/cm and decreases monotonically from 295 to 15K. As the temperature increases an anomalous peak is observed in the range of 250 to 300 K. This anomaly has been attributed to the chemi-absorbed molecules on the surface of the fiber and could be reduced by improving the vacuum conditions.

¹PREM (NSF-DMR-0934195) and APS (Minority Scholarship for Undergraduates)

Maritza Reyna
University of Puerto Rico at Humacao

Date submitted: 09 Nov 2010

Electronic form version 1.4