

## Tuneability Sub-10-nm WO<sub>3</sub> Nano-Flakes and Their Electrical Properties

**Authors :** S. Zhuiykov, E. Kats

**Abstract :** Electrical properties and morphology of orthorhombic  $\beta$ -WO<sub>3</sub> nano-flakes with thickness of ~7-9 nm were investigated at the nano scale using energy dispersive X-ray diffraction (XRD), X-ray photo electron spectroscopy (XPS) and current sensing force spectroscopy atomic force microscopy (CSFS-AFM, or PeakForce TUNATM). CSFS-AFM analysis established good correlation between the topography of the developed nano-structures and various features of WO<sub>3</sub> nano-flakes synthesized via a two-step sol-gel-exfoliation method. It was determined that  $\beta$ -WO<sub>3</sub> nano-flakes annealed at 550°C possess distinguished and exceptional thickness-dependent properties in comparison with the bulk, micro- and nano-structured WO<sub>3</sub> synthesized at alternative temperatures.

**Keywords :** electrical properties, layered semiconductors, nano-flake, sol-gel, exfoliation WO<sub>3</sub>

**Conference Title :** ICBN 2014 : International Conference on Biotechnology and Nanotechnology

**Conference Location :** Sydney, Australia

**Conference Dates :** December 15-16, 2014