

Tuneability Sub-10-nm WO₃ Nano-Flakes and Their Electrical Properties

Authors : S. Zhuiykov, E. Kats

Abstract : Electrical properties and morphology of orthorhombic β -WO₃ 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 WO₃ nano-flakes synthesized via a two-step sol-gel-exfoliation method. It was determined that β -WO₃ nano-flakes annealed at 550°C possess distinguished and exceptional thickness-dependent properties in comparison with the bulk, micro- and nano-structured WO₃ synthesized at alternative temperatures.

Keywords : electrical properties, layered semiconductors, nano-flake, sol-gel, exfoliation WO₃

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

Conference Location : Sydney, Australia

Conference Dates : December 15-16, 2014