



Synthesis and characterization of ZnO nanowires for nanosensor applications

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Abstract

In this paper we report the synthesis of ZnO nanowires via chemical vapor deposition (CVD) at 650 C. It will be shown that these nanowires are suitable for sensing applications. ZnO nanowires were grown with diameters ranging from 50 to 200 nm depending on the substrate position in a CVD synthesis reactor and the growth regimes. X-ray diffraction (XRD), scanning electron microscopy (SEM), transmission electron microscopy (TEM), X-ray photoelectron spectroscopy (XPS), photoluminescence (PL), and Raman spectroscopy (RS) have been used to characterize the ZnO nanowires. To investigate the suitability of the CVD synthesized ZnO nanowires for gas sensing applications, a single ZnO nanowire device (50 nm in diameter) was fabricated using a focused ion beam (FIB). The response to H₂ of a gas nanosensor based on an individual ZnO nanowire is also reported.