

Abstract Submitted
for the MAR11 Meeting of
The American Physical Society

Synthesis and characterization of ZnO nanostructures for sensor application¹ XIAOYAN PENG, JIN CHU, University of Puerto Rico, BOQIAN YANG, University of Massachusetts, PETER FENG, University of Puerto Rico, FENG TEAM — ZnO nanostructures including nanoparticles (diameter about 50nm), nanorods (diameter about 150 nm and length about 1-1.5 μ m) and nanoparticles (diameter \sim 20 nm) were prepared onto Si (100) substrates using both r.f sputtering and PLD technique, respectively. Thermal annealing was performed at 800 °C in atmosphere for 2 hours to improve the qualities of ZnO crystalline structures. X-ray diffraction, electron scanning microscope and Raman scattering have been used to characterize all these nanostructured samples After synthesis and initial characterizations, the ZnO nanostructure-based field effect transistor sensors have been designed, fabricated, and tested. High sensitivity (few PPM), quick time response (less than 1 second) of the newly designed sensors have been achieved. Experimental data indicate that the sensitivity of the sensor highly relies on the operating temperature.

¹This work is partially supported by NSF-DMR (0706147)

Xiaoyan Peng
University of Puerto Rico

Date submitted: 17 Nov 2010

Electronic form version 1.4