

Abstract Submitted
for the MAR11 Meeting of
The American Physical Society

Fe doped ZnO nanotubes synthesized by low temperature electrochemical process GOPAL SAPKOTA, KAROL GRZYCZYNSKI, ARUP NEOGI, USHA PHILIPOSE, University Of North Texas, Denton, TX — We report the synthesis of Fe doped ZnO nanotubes (NTs) with tube diameter of about 60-100 nm and wall thickness of about 20nm. To the best of our knowledge, this is the first report on Fe doped ZnO NTs, that could possibly be ferromagnetic. Fe doping will enable us to tune the electrical, optical and magnetic properties of the NTs which are crucial for practical applications (spintronics and optoelectronics). The morphology of the NTs was found to be very sensitive to concentration and temperature of the electrolyte and growth time. Structural and compositional analysis revealed that Fe was incorporated into the ZnO lattice. High Resolution Transmission Electron Microscopy and X-ray diffraction shows good crystalline quality of the NTs with preferential growth along the wurtzite c-axis. Room temperature photoluminescence (PL) measurement of the NTs exhibit strong UV emission around 370nm whereas low temperature PL of the NTs exhibits the optical signature of Fe doping.

Gopal Sapkota
University Of North Texas, Denton, TX

Date submitted: 27 Nov 2010

Electronic form version 1.4