

# GRAVITATIONAL LEVEL EFFECTS ON OPTICAL PROPERTIES OF ELECTRODEPOSITED ZnO NANOWIRE ARRAYS

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The coupling phenomena between the interfacial reaction rate and the microstructural/morphological variation rate must be reasonably well controlled to fabricate nano/meso- structural devices in a large scale. Otherwise, the physical property uniformity inside the device is not guaranteed to lose its superiority in the market. Free standing ZnO nanowire array was successfully synthesized on ITO/FTO substrate by template-free method in  $\text{Zn}(\text{NO}_3)_2$  aqueous solutions. Two types of electrode configurations were employed in order to quantitatively examine the effect of gravitational strength on electrodeposited ZnO nanowire array: (a) a horizontal cathode surface facing downward over an anode (C/A) and (b) an anode over a cathode (A/C). The former configuration may simulate the microgravitational environment, because macroscopic natural convection is not induced. PL of ZnO nanowire array was measured. More uniform nanowires are synthesized in C/A configuration than in A/C. Seeding ZnO nanoparticles on ITO/FTO substrate can control the diameter as well as the orientation.

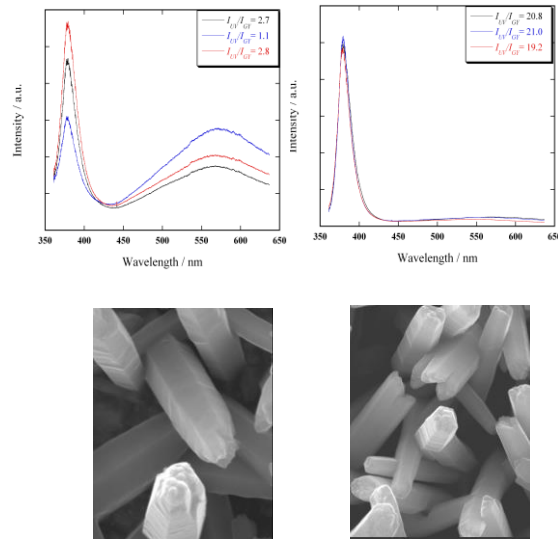


Figure (a) PL spectra from ZnO electrodeposited in Aq. Solution

(b) SEM images of electrodeposited nanowire  
(left) A/C , (right) C/A