



UNIVERSITEIT VAN PRETORIA  
UNIVERSITY OF PRETORIA  
YUNIBESITHI YA PRETORIA

Contribution ID: 176

Type: **Poster Presentation**

## Structural, morphological and luminescence properties of hexagonal ZnO particles by wet chemical process

*Tuesday, 10 July 2012 17:30 (2 hours)*

### Abstract content <br> (Max 300 words)

ZnO particles of different sizes were synthesized using a simple wet chemical method. This is a very attractive method, inexpensive and convenient for large area deposition. It is a low temperature process and the properties are easy to change by varying the deposition parameters. So-prepared ZnO particles were then characterized using scanning electron microscope, X-ray diffraction, PL spectroscopy and UV-Vis optical absorption spectra. The XRD pattern of a typical ZnO structures grown using wet-chemical process exhibit sharp diffraction peaks characteristic of the ZnO wurtzite hexagonal phase (wurtzite-type, space group P6<sub>3</sub>mc, JCPDS card file No. 36-1451). SEM image confirm the hexagonal ZnO structure. The UV-vis absorption spectra of ZnO structures show that samples prepared at high pH value demonstrated similar properties as bulk materials. It was also found that energy band gap (E<sub>g</sub>) does not increase significantly with the increase in molar concentration of reactant solution. The PL measurement depicts that the relative intensity difference between UV emission and green emission in ZnO generally depends on the process condition, particle size, source materials, and synthesis method. The characteristic emissions were found to be extremely broad and this broadening may be due to photon assisted by phonon transition.

### Apply to be<br> consider for a student <br> award (Yes / No)?

No

### Level for award<br>(Hons, MSc, <br> PhD)?

No

### Main supervisor (name and email)<br>and his / her institution

N/A

### Would you like to <br> submit a short paper <br> for the Conference <br> Proceedings (Yes / No)?

yes

**Primary author:** Prof. DEJENE, Francis (University of the Free State)

**Co-authors:** Prof. SWART, Hendrik (University of the Free State); Dr DOLO, Jasper (University of the Free State); Mr KOAO, Lehlohonolo (University of the Free State)

**Presenter:** Prof. DEJENE, Francis (University of the Free State)

**Session Classification:** Poster Session

**Track Classification:** Track A - Division for Condensed Matter Physics and Materials