

## pH Controlled Synthesis and Characterization of ZnO Nanoparticles Synthesized by Microwave Assisted Synthetic Method

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Dilute Magnetic Semiconductors (DMS) with potentials for spintronic application have gained much researches interest. Considerable effort has been devoted to ZnO semiconductor material due to its wide band gap of 3.37 eV, large exciting binding energy of 60 meV and small exciton Bohr radius of 2.34 nm, moreover, ferromagnetism at room temperature can be achieved when doped with transition metals.  $\text{Co}_{0.1}\text{Zn}_{0.9}\text{O}$  nanoparticle with different pH (7.0, 9.0, 11.0 13.0) were synthesized by microwave assisted synthesis method calcined at 600 °C. The structural, optical and magnetic properties of these nanoparticles were studied using X-ray diffraction (XRD), UV-Visible Spectroscopy, Photoluminescence Spectroscopy (PL), Fourier Transform Infrared Spectroscopy (FTIR) and Vibrating Sample Magnetometer respectively (VSM). The structural property confirms the effect of pH in the formation of pure crystalline  $\text{Co}_{0.1}\text{Zn}_{0.9}\text{O}$  nanoparticles. The optical property of  $\text{Co}_{0.1}\text{Zn}_{0.9}\text{O}$  samples at different pH value were studied. The magnetic behavior of  $\text{Co}_{0.1}\text{Zn}_{0.9}\text{O}$  nanoparticle were also identified.

**Keywords:** ZnO, Co doped ZnO, structural, optical, magnetic properties.

### Biography

Sabiu Said Abdullahi is a PhD candidate at Bayero University Kano (BUK) having a research program at University Putra Malaysia (UPM). He received his first Degree from Bayero University Kano, Nigeria in 2011 with Bachelor of Science in Physics. He obtained degree in Masters of Science in Physics from Fatih University Istanbul, Turkey in 2014 specializing in the synthesis and characterization of nanomaterial. His current research is on Transition metals doped ZnO nanoparticle for spintronic application. He has publication in professional journals.