

## Synthesis and characterization of zinc oxide nanoparticles.

### ABSTRACT

Zinc oxide (ZnO) nanoparticles had been successfully synthesized via solution combustion method. Zinc nitrate hexahydrate ( $\text{Zn}(\text{NO}_3)_2 \cdot 6\text{H}_2\text{O}$ ) and glycine ( $\text{NH}_2\text{CH}_2\text{COOH}$ ) was used as an oxidant and fuel, respectively. These reactants were mixed in different fuel-to-oxidant (F/O) ratios before undergoes different calcination temperatures (400, 500 and 600 °C) for 2 hours in order to obtain desired product. The synthesized ZnO powders were characterized via XRD, FT-IR, SEM and TEM. The XRD and FT-IR data confirmed the formation of high purity of ZnO nanoparticles. SEM showed the morphology of ZnO was in spherical shape. The particle size of ZnO was found to increase from low F/O to high F/O ratio. Increment in calcination temperatures also tends to form the larger particle size due to the agglomeration of the particles. ZnO nanoparticles with different sizes were prepared by adjusting the molar ratio of zinc precursor to glycine and calcination temperatures.

**Keyword:** Zinc oxide; Nanoparticles; Solution combustion.