

## Preparation and Properties of Coated Zinc Oxide Nano-particles

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### 1.Introduction

Zinc oxide nano-particles have been paid more attention for their unique properties. Particle surface modification is regarded as one of the most effective ways to improve the particles properties.

A novel way to prepare coated zinc oxide nano-particles was employed in this research, which is the coating precipitation process was induced on the precursor of zinc oxide. It is expected that a homogeneous coating layer would be formed.

### 2.Experimental

$\text{Al}_2(\text{SO}_4)_3$  or  $\text{Ti}(\text{SO}_4)_2$  and  $\text{NH}_4\text{HCO}_3$  solution were dropped onto separate spots on the suspension of basic carbonate of zinc. After filtering, washing and drying, coated zinc oxide nano-particles were prepared by calcining the resulting precursor powders at 600 °C for 1 hour.

TEM, XRD and  $\zeta$  potentials were used to characterize the phases and surface properties of modified zinc oxide.

### 3.Results

TEM shows that there is a homogeneous layer coated on the ZnO particles. XRD shows that the coatings are  $\text{ZnAl}_2\text{O}_4$  and  $\text{ZnTiO}_3$  phases.

pH in  $\zeta$  potentials equivalent zero changed from 10.3 to 6.0 and 8.4 after the ZnO modified with  $\text{ZnAl}_2\text{O}_4$  and  $\text{ZnTiO}_3$ , respectively.

ZnO nanoparticles coated with  $\text{ZnAl}_2\text{O}_4$  have lower catalytic activity and high capability of absorbing UV radiation.