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 regard as one of the most effective way 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 \( \xi \) 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.
\( \text{pH} \) in \( \xi \) 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.
\( \text{ZnO} \) nanoparticles coated with \( \text{ZnAl}_2\text{O}_4 \) have lower catalytic activity and high capability of absorbing UV radiation.