

## Preparation and characterisation of nano-TiO<sub>2</sub> powder

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**Abstract.** Titania (TiO<sub>2</sub>) is an important metal-oxide semiconductor and has a broad range of industrial applications in areas including pigments, photocatalysts, solar cells, ceramics, inorganic membranes, sensors, nonlinear optics, environmental purification, cosmetics, fillers, coating and photoconductors. Nano-sized TiO<sub>2</sub> powders have been prepared by thermal hydrolysis of TiCl<sub>4</sub> in a mixed solvent of ethanol and water. The crystalline structure and morphology of the powders have been characterized by X-ray diffraction (XRD), thermogravimetry (TG-DTG) and scanning electron microscopy (SEM). X-ray diffraction analysis showed that the particle was amorphous after synthesis and became anatase after heat treatment at 600°C and converted to rutile after heat treatment at 800°C. The particle size increased with the increase of heat treatment temperatures from 17 nm at 500°C to 56 nm at 800°C.

**Keywords:** titania, thermal hydrolysis, X-ray diffraction, scanning electron microscopy (SEM).

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