

## Investigation on Titania Photocatalyst Co-doped with La<sup>3+</sup> and N<sup>3-</sup> by Hydrothermal Method

Zhou Yanping, Liu Zhongqing, Li Zhenhua, Ge Changchun

Laboratory of Special Ceramics and Powder Metallurgy,  
University of Science and Technology Beijing, Beijing 100083, P.R.China

### Abstract

The TiO<sub>2</sub> photocatalysts co-doped with La<sup>3+</sup> and N<sup>3-</sup> were prepared by hydrothermal method with TiOSO<sub>4</sub> as the precursor. The obtained powders were characterized by means of XRD, BET, XPS and Uv-vis diffuse reflectance spectra. Furthermore, the photocatalytic activity of the prepared catalysts under visible light was researched with methylene blue (MB) as objective contamination under irradiation of electron saving-energy lamp with major emission at 545 nanometer. The results show that the La<sub>x</sub>TiO<sub>2-y</sub>N<sub>y</sub> powder has narrower optical band gap due to substitution N<sup>3-</sup> for O<sup>2-</sup> of titania lattice, more enhanced separation efficiency of photoexcited electron-hole pairs and accordingly higher visible light activity than the as-prepared TiO<sub>2</sub>, La<sub>x</sub>TiO<sub>2</sub> and TiO<sub>2-y</sub>N<sub>y</sub>.

**Keywords :** Hydrothermal method, Titania, Co-dope, Photocatalytic activity