

### Thermal Stability and Photocatalytic Activity of Mesoporous TiO<sub>2</sub> with Spherical Morphology

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Environmental pollutions caused by dyes and heavy metal in water have provided much attention in use of semiconductors as photocatalyst to initiate photocatalytic reaction at their surface. Especially, TiO<sub>2</sub> has been the most widely used photocatalyst because of their various advantages, such as low cost, chemical stability and non-toxicity. However anatase TiO<sub>2</sub> has large band gap and adsorbs light only in the UV region. To solve this problem, many techniques have been examined to achieve the extend of the absorption wavelength range of TiO<sub>2</sub> in visible region. In order to improve photocatalytic activity, we prepared mesoporous titania sphere. Mesoporous titania sphere show high photocatalytic activity because of its high surface area. In this study, mesoporous TiO<sub>2</sub> sphere with various heat treatment temperatures were synthesized. Photocatalytic activity of the samples was evaluated by degradation of methylene blue under UV light. The resulting photocatalysts were characterized by X-ray diffraction (XRD), Scanning electron microscopy (SEM), N<sub>2</sub> adsorption-desorption isotherm, and UV-Vis spectrometer.