

Thermal Stability of Disordered Mesoporous TiO₂ and Its Photocatalytic Activity of Methylene Blue Photo-Degradation

박수빈, 이정화¹, 김지민^{1,†}
성균관대학교; ¹성균관대학교 화학과
(jimankim@skku.edu[†])

TiO₂ is one of the best semiconductors for photocatalysis due to high band gap energy, high stability and catalytic activity, and non-toxicity. For high photocatalytic activity, photocatalysts should have high specific area and crystallinity. However, nanopores could be collapsed at high temperature which is the condition to form high crystallinity.

Here, we reported that thermally stable disordered nanoporous TiO₂ was synthesized by *in-situ* hydrolysis of titanium glycolate at various heat treatment conditions from 100 °C to 700 °C. Upto 500 °C, nanoporous structure of synthesized material is thermally stable with relatively high BET surface area (50 m²•g⁻¹) and high anatase crystallinity.

Photocatalytic activity of synthesized products was evaluated with methylene blue solution under UV 254 nm lamp. Among the samples, heat treated at 500 °C sample exhibits the highest photocatalytic activity due to its relatively higher surface area and crystallinity.