

전이금속 도핑에 따른 TiO₂ 분말의 광촉매 특성
Photocatalytic Behaviors of Transition Metal Ions Doped TiO₂ Synthesized
by Mechanical Alloying

우승희^{a*}, 김흥회^a, 김선재^b, 이창규^a

^a한국원자력연구소, 원자력재료기술개발부

^b세종대학교 나노기술연구소/나노공학과

Transition metal ions(Ni²⁺, Cr³⁺ and V⁵⁺) doped TiO₂ nanostructured powders were synthesized by mechanical alloying(MA) to shift the adsorption threshold into the visible light region. The synthesized powders were characterized by XRD, SEM, TEM and BET for structural analysis, UV-Vis and photoluminescence spectrum for the optical study. Also, photocatalytic abilities were evaluated by decomposition of 4-chlorophenol(4CP) under ultraviolet and visible light irradiations. Optical studies showed that the absorption wavelength of transition metal ions doped TiO₂ powders moved to visible light range, which was believed to be induced by the energy level change due to the doping. Among the prepared TiO₂ powders, Ni²⁺ doped TiO₂ powders, showed excellent photo-oxidative ability in 4CP decomposition.

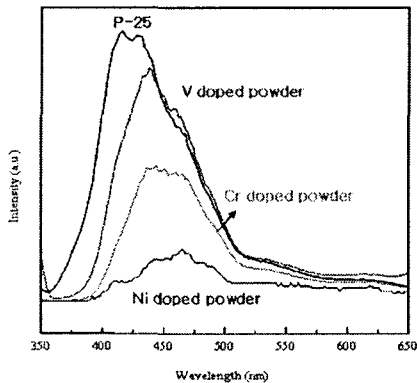


Fig. 1. Photoluminescence spectra of prepared TiO₂ powders by mechanical alloying with various transition metal.

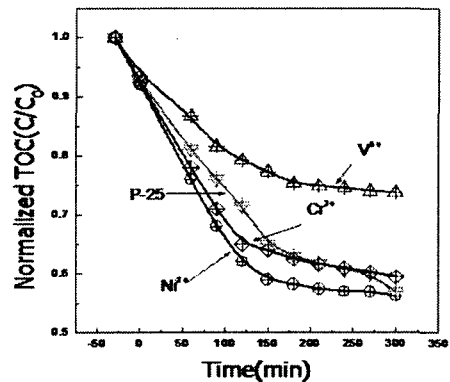


Fig. 2. Variations in the amount of total organic carbon(TOC) during the degradation of 4-chlorophenol by photocatalytic reaction on doped TiO₂ powders under visible irradiation.

Reference

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