

**A Study on formation and characteristic of titanium oxynitride derived from the precipitated complex of titanium(III) chloride and ammonium hydroxide**

장점석, 김현규, 배상원<sup>1</sup>, 황동원<sup>2</sup>, 지상민<sup>1</sup>, 손효창<sup>1</sup>, 이재성<sup>1,\*</sup>  
포항공과대학교 환경공학부; <sup>1</sup>포항공과대학교 화학공학과;  
<sup>2</sup>삼성전자  
(jlee@postech.ac.kr\*)

TiO<sub>2-x</sub>N<sub>y</sub> nanoparticle was formed by employing the complex of titanium(III) chloride and ammonium hydroxide as a source of nitrogen. During calcination, an anatase phase of titanium oxide was formed and a part of oxygen in titanium precipitate was successfully substituted by nitrogen originated from strong interacted (or adsorbed) ammonium hydroxide on titanium precipitate. The resulting oxynitride photocatalysts absorb the visible light region, which suggests that the bandgap of TiO<sub>2-x</sub>N<sub>y</sub> is narrowed, comparing to that of titanium oxide. Although absorption region is like a small shoulder, TiO<sub>2-x</sub>N<sub>y</sub> photocatalyst has the photoactivity to decompose gaseous 2-propanol (IPA) under visible light irradiation. In this work, we investigate the mechanism to form TiO<sub>2-x</sub>N<sub>y</sub> and characterize its physical and chemical properties.