

Preparation of visible light driven photocatalysts:  
Nitrogen-doped and chlorine-doped  $\text{TiO}_2$

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Recently, extensive efforts have been made in the development of visible light driven photocatalysts (PC) that can efficiently utilize solar or indoor light. As results of these efforts, several types of visible light driven PC were recently developed. Nitrogen-doped  $\text{TiO}_2$  reported by Sato and Asahi et al. can be easily prepared, and hence, have been attracting broad interests.

However, the nitrogen-doped  $\text{TiO}_2$  has a drawback: it is very vivid yellow absorb a large amount of visible light, and its photocatalytic activity depends on absorbance. We report here Nitrogen-doped  $\text{TiO}_2$  visible light driven PC ( $\text{TiO}_{2-x}\text{N}_x$ ), and a new type of visible light driven PC, i.e. chlorine-doped  $\text{TiO}_2$  ( $\text{TiO}_{2-x}\text{Cl}_{2x}$ ), prepared from  $\text{TiCl}_3$  solution.