

Synthesis and characterization of M (Ag, Au)-coupled TiO₂ with the various size of metal species

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Titanium dioxide (TiO₂) is widely used for photocatalysis of organic pollutants from both water and air. In many cases, to improve the photocatalytic activity of TiO₂, the metal particles has been attached on TiO₂ surface. Catalytic activity generally increases as the average size of the metal particle becomes smaller. However, there exists an optimal metal particle size for the best catalytic efficiency in case of each specific metal coupled system. In this work, metal-coupled TiO₂ was synthesized to evaluate how the metal particle size had an effect on the photocatalytic property. Metal-coupled TiO₂ catalyst were prepared by a deposition-precipitation method and controlled the pH or temperature. The size of metal particles and the shape of catalyst were investigated by transmission electron microscope (TEM) and the property of light absorption was characterized by diffuse reflectance UV-Vis spectrophotometer. The photocatalytic activities of as prepared samples were characterized by the decoloration of aqueous methylene blue solution under Xenon light source.