

Enhancement of Photocatalytic Activity between Carbon – coated Titanium Oxide

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Nowadays carbon-coated TiO₂ is attracting material for the improvement of photocatalytic activity due to its high adsorbability and crystallinity of anatase type TiO₂. In this work, the carbon-coated TiO₂ was prepared from following ways i) a powder mixture of TiO₂ (P-25, Degussa) with polymers and ii) directly preparation from hydrolysis of titanium tetraisopropoxide (TTIP) with an aqueous solution of polymers under 500°C to 900°C temperature. The amount of carbon contents on TiO₂ particles was controlled by changing the ratio and concentration of polymers. The transformations of rutile from anatase was suppressed up to 800°C with a carbon contents above 5%, meanwhile the phase transformation of anatase to rutile was observed at above 600°C in the case of parent TiO₂. The adsorption studies of two commercial dyes (methylene blue and black5) indicated that carbon-coated TiO₂ has a high adsorption capacity compared to that of P-25. In addition, photodecomposition of reactive dyes on carbon-coated TiO₂ was highly dependent on carbon contents, particle size and heating temperature.