Synthesis of Carbon-coated TiO_2 by Sol-Gel Process

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Titania gel was prepared by the addition of titanium-tetraisopropoxide (TTIP) in Sol-Gel process. Fine particles of photocatalytic anatase-type titanium oxide (TiO2) was prepared through the hydrolysis of TTIP where carbon coating was done by through the precipitation of poly vinyl alcohol (PVA) aqueous solution, at a temperature between 400 to 900℃ for 1h in an Ar gas flow. Since the carbon layers formed on the TiO2 particles were porous, the samples showed a high adsorptivity and the photoactivity of TiO2. Without carbon coating, the phase transformation from anatase to rutile started above 600℃, However it was suppressed up to 800℃ for carbon – coated TiO2. The sample prepared at 800℃ with a carbon content of 1~10 wt% suppressed the transformation of anatase to rutile with the thin carbon layer which can be easily penetrated by UV rays.