

Effects of Process Conditions to Control Morphology of Nano TiO₂ Thin Films

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Plasma Chemical Vapor Deposition (PCVD) is an important technique for surface modification of deposited thin films. The effects of process variables on the precursor decomposition, deposition rate and properties of TiO₂ films by PCVD of titanium tetra-isopropoxide (TTIP) have been investigated. Two different morphologies were observed: a granular morphology and a smooth morphology. The granular morphology was consisted of nanoparticles, approximately 20 nm in diameter, which aggregated into fractal structures on the substrate. The smooth morphology was induced by the deposition of reactive radicals on substrate after the decomposition of TTIP in the plasma phase. The prepared samples were mainly characterized by transmission electron microscopy, field emission scan electron microscopy, and FT-IR.