

Hydrophilicity and Photocatalytic Activity of TiO₂ Thin Films Coating on Glass

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TiO₂ could apply self-cleaning fields as well as photocatalytic reaction to decompose toxic organic compounds because of photocatalytic and hydrophilic materials. For the photocatalytic mechanism, it has been known that the photogenerated electrons and holes react with O₂ and H₂O in air and produce the active oxygen species ($\bullet\text{O}_2^-$ and $\bullet\text{OH}$) with strong oxidation power. They attack toxic and harmful organic compounds for their decomposition. On the other hand, the hydrophilicity of TiO₂ is related with the interfacial property. When TiO₂ was irradiated under UV light, its interfacial composition was changed and it allows water to spread completely across the surface without remaining the droplets. The interesting point is that the photocatalytic reaction and hydrophilicity of TiO₂ take place simultaneously on its surface. Some groups investigated the relationship between the activity and hydrophilicity of photocatalyst for self cleaning. In our work, we investigated the photocatalytic activity and hydrophilicity of TiO₂ film coated on glass with three different TiO₂ sols by spin coating method and compared those of the calcined and uncalcined TiO₂ thin films.