

醋酸处理对TiO₂纳米薄膜光催化性能的影响

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收稿日期 修回日期 网络版发布日期 接受日期

摘要 用溶胶-凝胶方法在普通玻璃基体上制备了均匀透明的TiO₂纳米薄膜,并经500℃煅烧2h,煅烧后的TiO₂薄膜在2 mol·L⁻¹的CH₃COOH水溶液中处理24h,最后分别在100和500℃进行第二次热处理,醋酸处理前后的薄膜分别用UV-vis, SEM, XRD和XPS进行了表征,并用甲基橙水溶液的光催化降解评价TiO₂纳米薄膜的光催化性能,结果发现:用醋酸处理后的TiO₂纳米薄膜的光催化活性高于处理前薄膜的光催化活性;而且,酸处理后经500℃热处理的TiO₂纳米薄膜的光催化活性明显高于经100℃热处理的TiO₂纳米薄膜的光催化活性。

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分类号 [0643](#)

Effects of CH₃COOH Treatment of Photocatalytic Activity of TiO₂ Nanometer Thin Films

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Abstract The uniform transparent TiO₂ nanometer thin films were prepared on soda-lime glass via sol-gel method and calcined at 500 °C for 2 h. The as-calcined TiO₂ thin films were treated in 2 mol·L⁻¹ CH₃COOH aqueous solution for 24 h, finally, the as-treated TiO₂ thin films were again heat-treated at 100 and 500 °C for 0.5 h, respectively. The structures and photocatalytic activity of TiO₂ thin films before and after surface acid treatment were characterized and evaluated by UV-vis, SEM, XED, XPS and photocatalytic decoloration of methyl orange aqueous solution, respectively. It was found that the photocatalytic activity of TiO₂ nanometer thin films was enhanced after CH₃COOH treatment. Moreover, the films showed higher photocatalytic activity at 500 °C than at 100 °C after surface acid treatment.

Key words [TITANIUM DIOXIDE](#) [NANOPHASE MATERIALS](#) [SOL-GEL PROCESS](#) [ACETIC ACID](#) [PHOTOCATALYSIS](#) [SEM](#) [XRD](#) [XPS](#)

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