

## **UV and Visible Light Active TiO<sub>2</sub>/WO<sub>3</sub> Powder and Film for Water and Air Purification**

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Powder nanocomposites of TiO<sub>2</sub>/WO<sub>3</sub> are prepared by a simple solid-state thermal procedure from commercial oxide powders and cast after that as a film on a substrate. The WO<sub>3</sub> content in the powder composites is varied from 0.5 to 50 %. The phase composition and morphology of titania/tungsten composites and films is characterized by SEM and X-ray analysis. The photocatalytic action of TiO<sub>2</sub>/WO<sub>3</sub> powders is tested with respect to the degradation of malachite green in water solutions under UV light irradiation. The effect of preparation temperature on the photocatalytic activity is also investigated. It is found that the mixed powder of 5%WO<sub>3</sub> is of best photocatalytic performance. The prepared powder photocatalyst is successfully deposited as a film for gas-phase application. The as-obtained composite films with 5%WO<sub>3</sub> are investigated in air purification from ethylene under UV and visible light illumination. The TiO<sub>2</sub>/WO<sub>3</sub> films show always a better activity than the pure TiO<sub>2</sub>.

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