

Photocatalytic Performance of TiO₂ Films on Carbon Felt Prepared by Sputtering Deposition

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In recent years, TiO₂ is one of the suitable materials in the electrical, catalysis and solar cell and environmental application. Many processing methods such as sol-gel, plasma spray, CVD and PVD can be used to prepare TiO₂ materials in powder or thin film type. Sputtering processes have favorable features such as lower process temperature, good adhesion, good uniformity and easy modification on the film properties. When anatase TiO₂ is irradiated with UV light that is greater than the band gap energy of the catalyst (E_g is 3.2 eV), then photocatalytic reactions occur.

In this work, TiO₂ films on carbon felt were deposited at different Ar:O₂ flow ratios by dc reactive magnetron sputtering. The influences of Ar:O₂ flow ratio on the microstructure and photocatalytic activities of TiO₂ films on carbon felt were investigated. The films were characterized using XRD, SEM, and UV-vis-NIR spectrophotometer. Photocatalytic activities of the samples were evaluated by the degradation of Perchlorate ions (ClO₄⁻) under UV irradiation.