Enhanced photocatalytic activity of N-doped TiO$_2$ deposited on carbon fibers

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**Abstract**

N-doped TiO$_2$ were successfully deposited on the surface of carbon fibers (CFs) by the sol–gel method. The synthesized samples show much higher adsorption capacity and photocatalytic activity for the degradation of Rhodamine B than the pure TiO$_2$ under visible light irradiation. The doped N can further enhance the photocatalytic activity of TiO$_2$ due to the significant synergistic effect between TiO$_2$ and N, which can introduce intermediate level between the conduction band and valence band of TiO$_2$, thus decreasing the band gap values effectively. Moreover, the deposition of doped TiO$_2$ on CFs can promote the transfer and separation of photoproduction carriers, improving the adsorption capability of the catalyst and facilitating the recovery of catalyst. Meanwhile photocatalytic activity of the catalyst is reproducible which demonstrates excellent stability and recyclability factors, which are crucial for practical application.

**Keywords:** Doped; TiO$_2$; Carbon fiber; Photocatalytic

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