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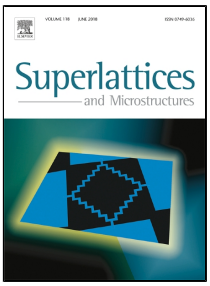

A facile and efficient method to directly synthesize TiO_2/rGO with enhanced photocatalytic performance

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A facile and efficient method to directly synthesize TiO_2/rGO with enhanced photocatalytic performance

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Abstract: A facile and efficient one-step hydrothermal method was performed to prepare the TiO_2/reduced graphene oxide (TiO_2/rGO). The obtained materials were characterized by X-ray diffraction (XRD), Raman spectra, transmission electron microscopy (TEM), X-ray photoelectron spectra (XPS) and UV-vis diffuse reflectance spectra. The results showed that the well dispersed TiO_2 nanoparticles with anatase were found uniformly distributed throughout the surface of rGO sheets. The as-prepared composite was used to photocatalytic degradation of Methylene blue (MB), and the experiment results show that TiO_2/rGO exhibited an enhanced photocatalytic activity for MB degradation under visible-light irradiation compared to Degussa P25, which was attributed to extended light absorption and increased charge separation efficiency due to excellent electrical properties of GO and the chemical bond between rGO and TiO_2 nanoparticles. The composite maintained a higher level of activity after five recycles without any significant loss of photo-catalytic activity. The results manifested that the facile synthesis *via* a one-pot hydrothermal treatment can provide an effective approach to enhance the performance of TiO_2/rGO, which is a promising candidate in wastewater treatment application.

Keywords: Graphene oxide; TiO_2/rGO; Hydrothermal synthesis; Interfacial interaction