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## Enhancement of photocatalytic properties of Bi<sub>2</sub>WO<sub>6</sub> nanoparticles by Pt deposition

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### Abstract

Bi<sub>2</sub>WO<sub>6</sub> nanoparticles were prepared using a hydrothermal method, and Pt was immobilized on the surface of Bi<sub>2</sub>WO<sub>6</sub> via a photo-assisted deposition (PAD) method. The samples produced were characterized using X-ray diffraction, ultraviolet and visible spectroscopy, photoluminescence emission spectra, transmission electron microscopy, extended X-ray absorption fine structure, and surface area measurements. Furthermore, the catalytic performance of the Bi<sub>2</sub>WO<sub>6</sub> and Pt/Bi<sub>2</sub>WO<sub>6</sub> samples was examined in the degradation of methyl orange dye (MO) under visible light. The extended X-ray absorption fine structure (EXAFS) results, which showed the presence of peaks assigned to the Pt-Pt at approximately 2.50 angstrom, indicate the formation of nanoscale Pt features. The UV-vis spectral analysis detected a red shift after loading the Pt into the Bi<sub>2</sub>WO<sub>6</sub>. The maximum degradation efficiency achieved was 100% with 0.3 Pt/Bi<sub>2</sub>WO<sub>6</sub> as the photocatalyst after a 30-min reaction time. The catalyst could be reused without any loss in activity for the first five cycles. (C) 2013 Elsevier Ltd. All rights reserved.

### Keywords

**Author Keywords:** Nanostructures; Oxides; Electron microscopy; XAFS; Catalytic properties

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