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## Enhanced Photocatalytic Activity of ZrO<sub>2</sub>-SiO<sub>2</sub> Nanoparticles by Platinum Doping

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### Abstract

ZrO<sub>2</sub>-SiO<sub>2</sub> mixed oxides were prepared via the sol-gel method. Photo-assisted deposition was utilized for doping the prepared mixed oxide with 0.1, 0.2, 0.3, and 0.4 wt% of Pt. XRD spectra showed that doping did not result in the incorporation of Pt within the crystal structure of the material. UV-reflectance spectrometry showed that the band gap of ZrO<sub>2</sub>-SiO<sub>2</sub> decreased from 3.04 eV to 2.48 eV with 0.4 wt% Pt doping. The results show a specific surface area increase of 20%. Enhanced photocatalysis of Pt/ZrO<sub>2</sub>-SiO<sub>2</sub> was successfully tested on photo degradation of cyanide under illumination of visible light. 100% conversion was achieved within 20 min with 0.3 wt% of Pt doped ZrO<sub>2</sub>-SiO<sub>2</sub>.

### Keywords

**KeyWords Plus:** TITANIUM-DIOXIDE; VISIBLE-LIGHT; BAND-GAP; TIO<sub>2</sub>; CATALYSTS; DEGRADATION; OXIDES; FILMS; ZRO2

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