



## **Preparation, Characterization and Photocatalytic Activity of sulphated V<sub>2</sub>O<sub>5</sub>-ZrO<sub>2</sub> Catalysts for the Degradation of Direct Blue-1 dye**

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*Received July 12, 2012; Accepted August 13, 2012*

**Abstract:** The X-ray powder diffraction (XRD), Fourier-transform infrared (FTIR), Ultraviolet (UV) spectroscopy, particle size analyzer methods are thus ideally suited for characterization and identification photocatalytic efficiency of 5% V<sub>2</sub>O<sub>5</sub> contain (5wt.%) ZrO<sub>2</sub> and non-sulphated ZrO<sub>2</sub> samples modified by NH<sub>4</sub>VO<sub>3</sub> prepared by wetness impregnation technique. Degradation of direct blue-1 (DB) dye was tested for the effectiveness of the samples. The results showed large surface area (183 m<sup>2</sup> g<sup>-1</sup>), small crystallites size and catalytic activity well correlates with the Lewis acid sites density of these catalysts, and showed a conversion comprises of 95% after UV irradiation (emitting at 365 nm) for 60 min exceeding that of SO<sub>4</sub> free ZrO<sub>2</sub> sample (68%) obtained at the same period of illumination. The DB photocatalytic degradation follows first order rate kinetics. More information on the activity, surface Characterization discussed for all samples

**Keywords:** *Sulphated zirconia, Photodegradation Degradation of direct blue-1 dye; Kinetics, Surface Characterization.*

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