"Novel One Step Synthesis of Cr/TiO$_2$ Modified With SiO$_2$ by Liquid Flame Aerosol Method (LFSP) for Liquid Phase Visible Light Phenol Photodegradation and Their Stability"

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Date: March 27, 2015
Time: 12:20 - 1:15 pm
Venue: Baldwin 749

ABSTRACT:
There has been an increasing interest in developing catalysts for visible light photocatalytic degradation of volatile organic compounds in the past decade. Cr modified TiO$_2$ have shown a higher efficiency in utilizing the visible light of the solar spectrum. Cr-TiO$_2$ nanoparticles have been synthesized by using flame spray pyrolysis (FSP), co-precipitation, and sol-gel synthesis techniques. Liquid phase photocatalytic activity of the synthesized catalysts by various methods were studied for photocatalytic degradation of 4-chlorophenol under visible light (400–800 nm) conditions. These materials are characterized with BET surface area, pore size distribution, X-ray diffraction (XRD), ultraviolet–visible light (UV-vis) spectra, and temperature-programmed reduction (TPR). The developed catalyst also demonstrated an advantage of low metal leaching during the catalytic reaction, avoiding secondary metal contamination to the treated wastewater. The optimal catalyst has also showed stability with time for the photocatalytic degradation of the phenol under visible light irradiation. The surface area and Cr content was stable for the fresh and used samples. The photocatalytic performance, characterizations and the effect of the SiO$_2$ incorporated Cr/TiO$_2$ material synthesized by the three different methods will be presented in the presentation.

Bio:
Siva Nagi Reddy Inturi studied Chemical engineering and received his Master’s at the Indian Institute of technology madras in India. Subsequently he joined Prof. Smirniotis, Panagiotis at UC, where he is doing his PhD. His work focuses on synthesis of catalyst by using flame aerosol method and studying the improvement in the visible light photocatalytic degradation of volatile organic’s from gas and liquid streams.