

Nanomaterials for Sensors and Photochemical Applications

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Abstract

Sensors are extensively used in a wide range of applications including environmental monitoring and food industry, safety-related issues, diagnostic and drug discovery. Great efforts have been done for developing a wide range of active, sensing nanomaterials for the detection of chemical analytes either in vapor or liquid phases. Additionally, considerable attention has been focused towards the development/designing of highly efficient visible light driven photocatalysts for the photodegradation, removal of highly toxic and harmful environmental pollutants. The advanced functional materials used in our research group for sensors and/or photocatalysts include a wide range of semiconductor metal oxides, alone or in combination with noble metallic nanoparticles, nanocarbon materials and conducting polymers. This presentation will give an overview of our recent research being done in the area of sensors technology (chemical sensors, electrochemical sensors and biosensors) and photochemical applications, focusing on photocatalysis under visible light illumination. The presentation will discuss some of the practical issues and challenges with the nanomaterial synthesis and characterization as well as some key sensing parameters such as sensor sensitivity, selectivity, response time and operational and long-term stability.