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A Special Issue on **Nanocatalysis and Its Applications**

Nowadays, globally increasing energy demands and growing environmental concerns have highlighted urgent issues and big challenges in exploring alternative energy sources and eliminating the emissions of carbon dioxide and toxic pollutants in our environment. Mitigating these important factors is critical for the survival of the planet and one way to tackle them is through advanced catalysis, such as photocatalysis, catalytic bioconversion, CO₂ conversion, CO oxidation and steam reformation, etc. Nanoscience and nanotechnology has played a key role in developing these processes and nanocatalysis research has undergone explosive growth in the past decades, utilizing nanoscale materials as catalysts for a variety of homogeneous and heterogeneous catalysis applications. A central aim of nanocatalysis research is to develop effective catalysts with sole selectivity, extremely high activity, low energy consumption, and a long lifetime. This objective can be achieved only by precisely controlling the size, dimensionality, morphology, spatial distribution, surface composition and electronic structure, and thermal and chemical stability of the individual nanocomponents for the catalysts. To this end, researchers worldwide have invested tremendous effort on controlled fabrication of nanocatalysts with distinct and tunable chemical activity, specificity and selectivity. Although these studies have contributed significantly to our fundamental understanding of catalysis, there are still big challenges involved in controlling their nanoscale structures at an atom-by-atom level and on the understanding their synthesis-structure-performance relationships. To address and highlight recent trends towards the development in the synthesis, applications, and engineering aspects of nanocatalysts, we invite researchers from various fields to contribute original research papers/communications as well as review articles to this special issue to be published in the *Journal of Nanoscience and Nanotechnology*, an international journal published by the American Scientific Publishers (www.aspbs.com).

The topics to be covered in this special issue include, but are not limited to:

- (i) **Synthesis, characterization, property and mechanism understanding of the fabricated nanocatalysts;**
- (ii) **Newly-developed nanomaterials, nanofabrication and applications in photocatalysis, electrocatalysis, environmental catalysis, catalytic biomass conversion, hydrogen production and carbon dioxide conversion;**
- (iii) **Role of engineered nanocatalysts in improving the performance of energy conversion and storage, e.g. fuel cells, solar cells, Li-ion batteries, supercapacitors, etc;**
- (iv) **Designed synthesis of nanocatalysts and their applications in waste treatment and environmental protection.**

We foresee this special issue becoming an international forum for researchers to summarize the most recent developments and ideas in nanocatalysis with a special emphasis given to state-of-the-art developments achieved within the last few years, which will benefit both academia and industry.

MANUSCRIPT SUBMISSION TO GUEST EDITORS

Manuscripts should be prepared strictly following JNN guidelines available at www.aspbs.com/jnn.

Prospective authors should submit a **single file** having text/figures/tables all together in both MS Word and PDF formats directly to the **Guest Editors via e-mail**. All manuscripts will be peer-reviewed to ensure a high quality of articles. *Please indicate in your cover letter that the submitted paper is 100% original and has not been published previously and is not currently submitted to any other journal and will not be submitted elsewhere before a final decision is made by this journal.*

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