

Thematic Proposal for ‘Current Nanoscience’

CVD design of metals and metal oxides for functional applications

Guest Editor: Prof. Dr. Zhen-Yu Tian

Aims and Scope:

Practical application of nanoscale functional materials especially metals and metal oxides as well as noble metals supported on oxides that are relevant to electronics, magnetics, photonics and catalysis is an active research area from both academic and industrial point of view. A grand challenge for nano-structured catalysts to energetic and environmental applications is the precise control of the activity by the accurate control of the assembly of the nanostructures. It is desired to explore the loop among the structure, properties and activity based on the combination of materials chemistry, advanced diagnostic technique, homogeneous and heterogeneous application. Chemical vapor deposition (CVD) owns the advantages of relatively low cost, tailored composition, simplicity and easy control of the thickness and morphology of the samples. Thus, it shows great potential to synthesize metals and metal oxides. Moreover, a wide spectrum of advanced and sophisticated techniques related to the surface science investigations has also been reported to link the macroscopic and microscopic aspects of the preparation (growth kinetics) and application (gas-phase and surface reactions) of the functional nanostructures. Fundamental understanding of formation and performance mechanisms in nanoscale; their electronic, optical, and thermal properties; and the size-dependent metals and metal oxides by tailoring their surface properties and nanostructures; as well as novel functions and applications of nanostructured materials, are the highlights of this special issue. The results will broaden the practical application and capability of nanoscale materials in both experimental and theoretical community.

The overarching aim of the current special issues is to provide the general theme of new nanotechnology tools and procedures for synthesizing low-cost but intelligent materials by CVD with predictable properties in the application areas of clean energy to allow the public emissions to meet air pollution control targets. Contributions of original research articles and reviews are welcome. Potential topics include, but are not limited to:

- 1) Novel CVD preparation techniques
- 2) Facile synthesis of thin films
- 3) Design of functional metals and metal oxides
- 4) Formation kinetics of CVD prepared samples
- 5) New characterization and diagnostic approaches
- 6) Catalytic oxidation of VOCs by innovative CVD-made nanomaterials
- 7) Electrochemical application and mechanism

Guest Editor: Zhen-Yu Tian

Full Professor, Alexander von Humboldt Fellow

Institute of Engineering Thermophysics, Chinese Academy of Science, Beijing 100190, China

Email: tianzhenyu@iet.cn

Important Dates:

Call for papers to special issue: July 20, 2015

Deadline to submit full papers: October 10, 2015

Review completion date: November 22, 2015

Final receive of all revised papers: December 22, 2015

Publication date: January 20, 2016