



Special Issue on
Novel Photocatalyst Concepts for Solar Energy Conversion: Low-Dimensional Carbon Materials and Nano hybrids

CALL FOR PAPERS

In the past several years, semiconductor photocatalysis has gained renewed interest because of its potential in solar-to-fuel energy conversion which is considered one of the grand challenges of our time. However, in order for semiconductor photocatalysis to address such tasks, design and development of high performance visible-light active catalysts in solar-to-fuel conversions are highly desired which would also require in-depth understanding of the associated photocatalytic reaction mechanisms. The aim of such studies is to discover new material systems that enable conversion efficiencies beyond 10%, the US Department of Energy's (DOE's) target for a commercially viable photocatalyst. In light of some of the common limitations associated with traditional titania-based photocatalysts, recent years have seen emergence of low-dimensional graphene-based nanostructures and nano hybrids in solar energy conversion applications owing to their excellent optoelectronic properties suitable for light-harvesting applications.

This special issue will focus on development of advanced nanostructured materials including two-dimensional graphene oxides, one-dimensional carbon nanotubes, zero-dimensional graphene-based quantum dots, and modified semiconducting nanocomposites in solar energy conversion applications such as photocatalytic hydrogen generation and CO₂ photoreduction. The main aim of this special issue is to search new ideas beyond TiO₂ and understand basic science for the development in current photocatalyst technologies for sustainable energy applications. This issue will involve a combination of full papers/articles, communications, reviews/perspectives, and mini-reviews.

Potential topics include, but are not limited to:

- ▶ Synthesis of advanced conventional and nonconventional catalytic materials
- ▶ Catalysis application in energy, for example, CO₂ photoreduction to solar fuels and photocatalytic water splitting for hydrogen generation
- ▶ Carbon-based nanostructures: novel approaches for the synthesis, properties, and energy related applications; advanced materials as building blocks in photocatalysis and photoelectrochemistry
- ▶ Plasmon-enhanced solar-to-fuel conversion and photoinduced charge transfer processes in advanced hybrid semiconducting nanostructures
- ▶ Band-gap engineering/surface defect engineering in semiconductor nanoarchitectures for high selectivity and improved solar-to-fuel conversion
- ▶ Understanding structure-function relationships over nanostructured photocatalysts including theoretical and computational studies

Authors can submit their manuscripts via the Manuscript Tracking System at <http://mts.hindawi.com/submit/journals/ijp/tevp/>.

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