

Special Issue on
**Structure-Engineered Semiconductor Nanomaterials for
Photovoltaics and Photocatalysis**

CALL FOR PAPERS

Sustainable energy production and pollutant removal have been the global hot topics of high importance that greatly impact the development of human society. As an inexhaustible energy resource abundantly available on planet earth, solar energy is the ideal solution to the energy crisis and environmental pollution. Among a range of ever-evolving technologies, photovoltaics and photocatalysis offer unique options for efficient solar energy harvesting and utilization including solar-electricity generation, solar-fuel production, and pollutant removal. Semiconductor nanomaterials, such as titanium dioxide, zinc oxide, and graphitic carbon nitride, have been rigorously studied in a variety of photovoltaic solar cells and photocatalytic applications and proven great success bringing forth numerous highly performing photovoltaic and photocatalytic systems. Structure engineering of semiconductor nanomaterials, either electronically or geometrically, has attracted tremendous research interest in recent years owing to its efficacy in improving the efficiency of photovoltaic solar cells and the photocatalytic activities of existing photocatalysts. For example, controlled doping of inorganic semiconductors can achieve very rapid carrier extraction in planar perovskite solar cells; tailored surface defects in metal oxide semiconductors can highly extend their light absorption to the visible region and enhance their photocatalytic efficiency; proper geometric structure engineering can tune many surface/interface kinetics. Without doubt, structure engineering has become one of the most important research topics. It opens a new avenue to the design of high-performance photovoltaics and photocatalysts. New insights on the photovoltaic/photocatalytic mechanisms at the surface and/or interface of the structure-modified semiconductor nanomaterials are needed to fully understand the structure-property relationship and to further optimize the materials/devices.

We solicit completed, high-quality, original research papers as well as review articles focusing on the advances in structure-engineered semiconductor nanomaterials for photovoltaic and photocatalytic applications.

Potential topics include but are not limited to the following:

- ▶ Applications of structurally modified semiconductor nanomaterials in photovoltaic solar cells and photocatalysis (photocatalytic pollutant removal, water splitting and CO₂ reduction)
- ▶ Effects of heteroatom doping on the photovoltaic/photocatalytic properties of semiconductor nanomaterials
- ▶ Extended solar light absorption or enhanced visible-light photoactivity by self-structural modification (e.g., oxygen vacancies, dislocations, etc.) of semiconductor nanomaterials
- ▶ Geometrical engineering of semiconductor nanomaterials for enhanced surface/interface processes in photovoltaics and photocatalysis
- ▶ Computational/ theoretical calculations on the photovoltaic/photocatalytic mechanisms of the structure-engineered semiconductor nanomaterials

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

Papers are published upon acceptance, regardless of the Special Issue publication date.

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