

Special Issue on  
**Advanced Materials for Energy Conversion and Storage**

## CALL FOR PAPERS

An ever-increasing consumption of fossil fuels has led to the global energy crisis and environmental deterioration. Electrical energy is considered to be one of the most promising alternatives for replacing fossil fuels energy. However, it was estimated that the total electricity consumed worldwide in 2017 is 22000 TWh, of which 56.1% is generated from fossil resources including nature gas, oil, and coal. The portion from renewable resources such as solar energy and wind energy has grown from 0.3% in 1987 to 9.6% in 2017, which is still significantly less than the contributions fossil-based sources. In order to be sustainable, clean, and renewable energy has to dominate electrical production as soon as possible. High-efficiency, safe, and low-cost energy conversion and storage technologies are the prerequisite to replacing fossil fuel energy with clean and renewable energy. Unfortunately, the current state-of-the-art energy conversion and storage technologies do not satisfy the above requirements.

Advanced materials are the key to both the high-efficiency conversion of clean and renewable energy into electrical energy, and the high energy-density electrical storage. This special issue focuses more on the progress of photovoltaics and electrolysis for high-efficiency energy conversion, as well as electrochemical processes for advanced energy storage. Much attention will be paid on achieving higher conversion efficiency, higher energy density, better safety, and lower cost.

This special issue aims to attract the submission of original research papers which address high-performance materials and devices and explore new mechanisms for energy conversion and storage. Review articles reporting on recent advances and developments in the field of energy conversion and storage are encouraged to submit as well.

Potential topics include but are not limited to the following:

- ▶ Electrode materials for advanced lithium-ion batteries, sodium-ion batteries, and lithium-sulfur batteries
- ▶ Advanced materials for supercapacitors and metal-air batteries
- ▶ High-capacity hydrogen storage materials and electrode materials for Ni-MH batteries
- ▶ Advanced materials for CO<sub>2</sub> capture and utilization
- ▶ Electrode materials and electrolyte materials for solid state batteries
- ▶ Advanced materials for low temperature fuel cells and electrolyzer cells
- ▶ Nanostructured materials for thin film solar cells and optoelectronic devices
- ▶ Organic, inorganic and hybrid materials for solar photovoltaics
- ▶ Organic and inorganic phase change materials for solar energy storage
- ▶ Theoretical investigations on electrochemical energy conversion and storage

Authors can submit their manuscripts through the Manuscript Tracking System at <https://mts.hindawi.com/submit/journals/jchem/materials.chemistry/amecs/>.

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

**Lead Guest Editor**

Chu Liang, Zhejiang University of Technology, Hangzhou, China  
[cliang@zjut.edu.cn](mailto:cliang@zjut.edu.cn)

**Guest Editors**

Lei Zhang, University of Maryland College Park, College Park, USA  
[leiz@umd.edu](mailto:leiz@umd.edu)

Vipul Kheraj, Sardar Vallabhbhai National Institute of Technology, Surat, India  
[vipulkheraj@gmail.com](mailto:vipulkheraj@gmail.com)

**Submission Deadline**

Friday, 27 December 2019

**Publication Date**

May 2020