

Special Issue on  
**Nanocatalysts for Next-Generation Chemical Energy  
Storage and Conversion Technologies**

# CALL FOR PAPERS

Chemical energy storage is at the heart of future smart electricity systems due to their scalability and huge potential of hydrogen and small organic molecules as energy vectors. Chemical energy storage technologies include photochemical and electrochemical water splitting reactors, fuel cells, and carbon dioxide reduction reactors. Yet, most of these technologies are not yet mature or economically viable. A great deal of challenge among these technologies is the high cost of the noble metal catalysts used for speeding up the otherwise kinetically controlled reactions. While many alternative noble metal-free or metal-free catalysts have been proposed, much can still be improved in decreasing their overpotential and sustaining its catalytic activity over time. Another key aspect in developing large-scale carbon dioxide conversion systems is the selectivity of the catalysts to the desired output (e.g., methanol, ethylene, and carbon monoxide) and its stability towards commercially viable CO<sub>2</sub> recycling.

We invite investigators to contribute original research articles as well as review articles that seek to address the issue of high cost of noble metal catalysts and the high overpotential needed for pushing reactions which are crucial in these chemical energy storage technologies. A particular interest will be given to papers, both experimental and theoretical or in combination, which explores novel nanocatalysts or novel material synthesis routes for low overpotential catalysis for hydrogen-oxygen systems, that is, hydrogen evolution reaction and oxygen evolution and reduction reactions and high selectivity and stability for the conversion of CO<sub>2</sub> into high value organic molecules. Original, high quality contributions that are not yet published or that are not currently under review by other journals or peer-reviewed conferences are welcome.

Potential topics include but are not limited to the following:

- ▶ Hydrogen evolution reaction nanocatalysts in photochemical, photoelectrochemical, and electrochemical water splitting
- ▶ Oxygen evolution reaction (OER) nanocatalysts
- ▶ Cathode nanocatalysts for oxygen reduction reaction (ORR) in the fuel cells
- ▶ Cathode nanocatalysts for carbon dioxide reduction
- ▶ Novel electrochemical or photochemical system designs for water splitting and carbon dioxide recycling
- ▶ First principle calculations on nanocatalysts in the reactions of interest

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

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