

## Editorial

# Functional Nanomaterials for Renewable Energy and Sustainability

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Modern societies thrive on an unprecedented level of energy consumption, which places a tremendous amount of stress on our environment. Indeed, energy renewability and environmental sustainability stand to be some of the most pressing challenges of our time. Continuous efforts have been devoted to the development of renewable alternative energies, particularly via environmentally friendly green synthesis methods, in order to address these two critically important and interconnected issues. This special issue to be published in 2017 aims at reporting recent progresses in renewable energies and green synthesis method. We have selected seven papers, representing three different technical frontiers of this topic: three on photovoltaics for solar energy conversion, two on sensor materials, and two on rechargeable lithium-ion batteries.

**Solar Energy Conversion.** V. Gâté et al. demonstrated a solar cell module, which leverages nanostructuring and a sol-gel process to improve the cost effectiveness of solar energy conversion.

W. M. N. M. B. Wanninayake et al. synthesized SnO<sub>2</sub> semiconductor nanoparticles and constructed a dye-sensitized solar cell prototype, achieving a conversion efficiency of 5.04%.

S. R. Lee et al. designed five types of conjugated phenylene polymer-modified photoanodes for quantum dot-sensitized solar cells.

**Sensor Materials.** R. Galos et al. fabricated a nanosensor module with electrospun piezoelectric (PZT) nanofibers, capable of more accurate measurement on nanoscale.

H. Xuemei et al. achieved a dramatic enhancement of the sensing characteristics of cubic In<sub>2</sub>O<sub>3</sub>, by fabricating *p-n* heterojunction-like NiO/In<sub>2</sub>O<sub>3</sub> composite microparticles as sensor material.

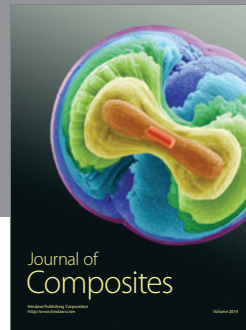
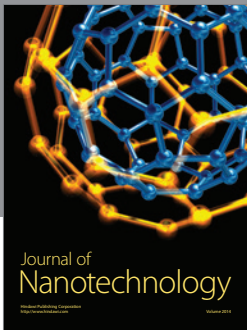
**Rechargeable Lithium-Ion Batteries.** M. V. Tran et al. synthesized a spinel Li<sub>4</sub>Ti<sub>5</sub>O<sub>12</sub> with size of ~100 nm, using LiOH and Ti(OBu)<sub>4</sub> as precursor, and found excellent discharge capacity and rate capabilities.

M. Liang et al. proposed an arc plasma evaporation-oxidation method to synthesize Fe<sub>2</sub>O<sub>3</sub>-based nanocomposites. As the anode material, this nanocomposite showed a high capacity of more than 500 mAh/g over 150 cycles.

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