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TMS 2017
146th Annual Meeting & Exhibition

February 26 – March 2, 2017
San Diego, California, USA

NANOCOMPOSITES IV: NANOSCIENCE FOR RENEWABLE ENERGY

In the year 2050, the demand for energy globally is expected to double to 28 terawatts. In addition, the need to protect our environment by increasing energy efficiency and developing clean energy sources will become more pronounced. In retaining our energy security, nanoscience and nanotechnology present exciting and necessary approaches to address the following challenges:

- More than 1,000 nanotechnology-based consumer products are available in the market
- Nanotechnology will generate above $2.5 trillion in 2020
- Governments and companies are spending billions of dollars every year on nanotechnology
- A large number of academic institutions are offering specialized courses in nanomaterials and nanotechnology

The basic steps of energy conversion, such as charge transfer, molecular rearrangement, and chemical reactions occur at nanoscale. The development of new nanoscale materials including nanocomposites, as well as the methods to characterize, manipulate, and assemble them, creates a unique platform for developing potent energy technologies.

Contributions are solicited in nanocomposites for:

- Scalable methods to split water with sunlight for hydrogen production
- Highly selective catalysts for clean and energy-efficient manufacturing
- Harvesting solar energy with potentially up to 20% power efficiency and 100 times lower cost
- Solid-state lighting at potentially up to 50% of the present power consumption
- Reversible hydrogen storage materials potentially operating at ambient temperatures
- Power transmission lines potentially capable of 1 gigawatt transmission
- Low-cost fuel cells, batteries, thermoelectrics, and ultra-capacitors
- Materials synthesis and energy harvesting based on the efficient and selective mechanisms of biology

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PROCEEDINGS PLANS

Selected papers from this symposium may be published in the TMS journal, *JOM*.

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