

Tentative Outline

Special Thematic Issue for Current Nanoscience

Green and sustainable nanomaterials for energy applications and corrosion inhibition

Guest Editors: Dr. Patrizia Bocchetta

Aims & Scope:

The necessity of a green-chemistry has significantly increased through the world in order to reduce environmental degradation associated to the quick increase of global energy demand from portable electronics to electric vehicles and also large-scale energy storage devices for smart grids.

In order to address the green challenge, fundamental and applicative research has exponentially increased in the last years following green and sustainable approaches toward energy conversion and storage as well as corrosion inhibition. Therefore, we have assisted to a technological revolution in energy sources, such as green solar, hydroelectric, biomass, wind, geothermal etc., and subsequent energy conversion (such as solar cells and fuel cells) and storage (such as batteries and supercapacitors).

In particular, fuel cell systems contributes to sustainability and environmental issues thanks to the chemistry and thermodynamics of hydrogen electrochemical oxidation which increases energy conversion efficiency and reduce to zero the pollutant emissions. Green aspects of fuel cells really challenging in order to design a really green device regards the components. Contributions aimed to collect novel green nanomaterials used in fuel cell membranes (for example natural polysaccharides, such as chitosan derivative) and electrocatalysts (metal-free materials) are particularly welcome.

Corrosion represents a serious problem of energy and material loss as well as drastic mechanical failure of energy devices and infrastructure durability. The development of novel environmental friendly corrosion inhibitors is highly required owing to both environmental alertness and chemical toxicity. For example, natural polysaccharides, such as chitosan derivatives, have been successfully tested as efficient corrosion inhibitors.

In this context, the potential of nanotechnology is colossal and can drastically improve efficiency of the functional materials used in both energy conversion and corrosion fields. Nanostructuring of active materials notably increases the performance of the device due to increase in specific surface area, catalyst centers number, among others.

This special issue invites original reviews focusing on the design, synthesis, theoretical and application of green nanostructured materials for energy applications and corrosion inhibition.

Subtopics:

The subtopics to be covered within this issue are listed below:

- **Design of Green Efficient Nanomaterials For Fuel Cells, Batteries and Solar Cells**
- **Biomimetic Synthesis and application of Nanoparticles: with special reference to their potential in energy applications and corrosion inhibition**
- **Chitosan nanocomposites for green corrosion inhibition**
- **Sustainable syntheses and sources of nanoparticles for microbial fuel/electrolysis cell applications: a review of recent progress**
- **Mesoporous silicates immobilizing N-doped TiO₂ quantum dots for photocatalysis: A comparative study on supports and synthetic methodology**
- **Applications of graphene in fuel cells and energy conversion: a review**
- **Starch as a sustainable fuel for combustion synthesis of metal oxide nanomaterials for energy applications**
- **Graphene-based nanomaterials: recent development and their applications in biofuel cells**
- **Green synthesis of 2D materials for energy conversion and storage applications**
- **Corrosion inhibition in Supercapacitors**
- **Design of Ni-containing nanostructures as cocatalysts for solar-to-hydrogen-conversion**
- **Green Nanomaterials for Energy Conversion Applications - A Review**
- **Emerging sustainable nanomaterials and their application in catalysis and corrosion control**
- **A comprehensive review for on green and sustainable nanomaterials fuel cell and corrosion inhibition**
- **A brief review on carbon- based nanomaterials for sustainable fuel cells technologies**

- **Recent Progress in Green Nanomaterials for Fuel Cell and Corrosion Inhibition: A Comprehensive Review**
- **Methodologies for Achieving 1D ZnO Nanostructures Potential for Solar Cells**
- **Eco-efficient synthetic processes and re-cycle analysis: Design of a new electrochemical storage systems**

Schedule:

- ✧ Manuscript submission deadline: 30 March 2020
- ✧ Peer Review Due: 15 May 2020
- ✧ Revision Due: 30 June 2020
- ✧ Final manuscripts due: 30 September 2020

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