



Journal of Nanomaterials

Special Issue on
Nanomaterials for Dye-Sensitized Solar Cells

CALL FOR PAPERS

Since their first report in 1991 by O'Regan and Grätzel, Dye-Sensitized Solar Cells (DSSCs) appeared immediately as a promising low-cost photovoltaic technology. In fact, though being far less efficient than conventional silicon-based photovoltaics (being the maximum, lab scale prototype reported efficiency around 13%), the simple design of the device, and the absence of the strict and expensive manufacturing processes needed for conventional photovoltaics make them attractive in small-power applications especially in low-light conditions, where they outperform their silicon counterparts. Nanomaterials are at the very heart of a DSSC, being the success of its design due to the use of nanostructures at both the photoanode and the cathode. The use of nanocrystalline titanium dioxide in the photoanode allows for a high dye loading (and so is high light harvest) per unit device area, considering that only a monolayer of dye is adsorbed on the TiO_2 surface. The nanostructured catalyst used on the cathode allows one to have a large number of active sites per unit device area, thus having a fast regeneration of the redox species in the electrolyte. Nanomaterials have also been used as additives in the electrolyte as gelators or to replace the liquid electrolyte with a solid phase to improve the stability of the devices.

This special issue aims to publish new results obtained in the research on nanomaterials for application in DSSCs in order to improve their performances and stability.

Potential topics include, but are not limited to:

- ▶ The design, synthesis, and characterization of new nanostructured materials for applications in cathodes, anodes, and electrolytes of DSSCs and their performances in real devices
- ▶ Theoretical modeling of nanostructured materials for DSSCs
- ▶ New nanomaterials for p-type DSSCs
- ▶ New approaches to control and optimize the porosity of nanomaterials for DSSC photoanodes (and photocathodes in p-type DSSCs)

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Lead Guest Editor

Alessandro Latini, University of Rome "La Sapienza", Rome, Italy
alessandro.latini@uniroma1.it

Guest Editors

Daniilo Dini, Università degli Studi di Roma La Sapienza, Rome, Italy
daniilo.dini@uniroma1.it

Meiyong Liao, National Institute for Materials Science, Tsukuba, Japan
meiyong.liao@nims.go.jp

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