Journal of Nanomaterials

Special Issue on

Advanced Nanotechnology-Based Strategies to Obtain Efficient Solid-State Lighting

CALL FOR PAPERS

The artificial lighting has become the essence of modern human society; therefore, it is extremely important to develop efficient and environmentally-friendly white light sources. Various light emitting diodes (LEDs) based on quantum dots (QDs) and quantum wells (QWs) have been extensively investigated in order to achieve the desirable emission color and enhance device efficiency. Solid-state lighting devices containing semiconductors as the light emitters have many advantages over fluorescent and incandescent light sources, such as energy saving, durability, and spectral tunability. Moreover, LEDs based light sources have a great potential to decrease the environmental pollution threats. However, inherently low efficiency of those LEDs, due to the low internal quantum efficiency (IQE) and difficulty of extracting the generated photons out of the device, poses a serious problem in their widespread applications. Owing to a high refractive index of inorganic emitting materials such as GaN, ZnO, CdSe, and Si QDs or QWs, there is an effective energy loss caused by total internal reflection at the emitter/air interface. Moreover, in those emitting materials, nonradiative electron/hole pair recombination dominates.

This special issue is focused on presentation of various strategies to improve the performance of solid-state light emitters. Original research papers, which present new perspectives and challenges in production of efficient optical materials for LEDs operating in a broad spectral range, are invited. Review articles summarizing the current state of the art in optical semiconductors are also very welcome.

Potential topics include but are not limited to the following:

- Different approaches to improve light extraction from emitters including surface engineering, a proper arrangement of refractive index, and deposition of antireflective layers
- Composite, hybrid, or core/shell heterostructures for improving luminescence properties of direct band-gap semiconductors
- Application of various coating layers or nanostructures (metallic, nonmetallic, ceramic, polymers, etc.) to control surface properties and defect-related luminescence
- The effect of various dopants on structural and optical quality of a given semiconductor
- Plasmonic enhancement of light emission by application of different metal particles or nanostructures supporting localized surface plasmon (LSP) and/or surface plasmon polariton (SPP) resonances
- Application of different fabrication methods and postfabrication strategies (annealing, plasma treatment, etc.) to control morphology, structure, and optical characteristics of an emitter

Authors can submit their manuscripts through the Manuscript Tracking System at https://mts.hindawi.com/submit/journals/jnm/soss/.

Papers are published upon acceptance, regardless of the Special Issue publication date.

Lead Guest Editor
Małgorzata Norek, Military University of Technology, Warsaw, Poland
malgorzata.norek@wat.edu.pl

Guest Editors
Qinghua Li, Lingnan Normal University, Zhanjiang, China
qhli@hqu.edu.cn

P. Kumar, Central University of Jammu, Jammu, India
pkumar.phy@gmail.com

Submission Deadline
Friday, 25 January 2019

Publication Date
June 2019