Hindawi Publishing Corporation
Journal of Nanomaterials
Volume 2014, Article ID 181365, 2 pages
http://dx.doi.org/10.1155/2014/181365

Editorial

Optical Properties of Nanoparticles and Nanocomposites

Pathik Kumbhakar,[1] Suprakas Sinha Ray,[2] and Andey L. Stepanov[3]

[1] *Nanoscience Laboratory, Department of Physics, National Institute of Technology (NIT), Durgapur, West Bengal 713209, India*
[2] *Council for Scientific and Industrial Research, Pretoria 0001, South Africa*
[3] *Nano-Optics and Nano-Plasmonics Group, Kazan Physical-Technical Institute, Russian Academy of Sciences, Kazan 420029, Russia*

Correspondence should be addressed to Pathik Kumbhakar; nitdgpkumbhakar@yahoo.com

Received 1 April 2014; Accepted 1 April 2014; Published 13 April 2014

Semiconductor and metallic nanomaterials and nanocomposites possess interesting linear absorption, photoluminescence emission, and nonlinear optical properties. Nanomaterials having small particle sizes exhibit enhanced optical emission as well as nonlinear optical properties due to the quantum confinement effect. Synthesis, characterization, and measurement of optical properties of nanomaterials with different anisotropic shapes have also drawn significant attention. Recently, a lot of research focuses have been given on the preparation of polymer semiconductor and other nanocomposite materials having potential applications in different optoelectronics and photonics devices.

In this special issue, research papers covering the following topics are called for publication and a total of 8 numbers of original research papers and review articles that have been accepted got publication. The topics include techniques of synthesis, characterizations, and optical properties of semiconductor nanomaterials, nanocomposites of polymer-semiconductor and graphene-metal nanoparticles, and plasmonic properties of metal nanoparticles and nanostructures.

In the paper entitled "*Sensing heavy metals using mesoporous-based optical chemical sensors*," Urek et al. have reviewed the recent advances, advantages, and limitations of mesoporous silica-based optical sensors for heavy metal detection. In the paper entitled "*Optical property characterization of novel graphene-X (X = Ag, Au and Cu) nanoparticle hybrids*," authors have reported their results on investigation on synthesis, nanostructural characterizations, and optical properties, including modifications of surface plasmon resonance (SPR) properties and of graphene-metal nanocomposite with the incorporation of nanoparticles in the graphene nanosheets. Chung et al. in their paper entitled "*Green light emission of $Zn_xCd_{1-x}Se$ nanocrystals synthesized by one-pot method*" have reported a facile one-pot synthesis technique for preparation of ternary nanocrystals of $Zn_xCd_{1-x}Se$ which show tunable photoluminescence light emission in the green wavelength region having quantum yield of 45–89%. Zhang et al. reported the synthesis of ZnO nanostructures with different morphologies, such as nanopyramids, nanosheets, and nanoparticles in their paper entitled "*Morphology and optical property of ZnO nanostructures grown by solvothermal method: effect of the solution pretreatment*." They have used Raman and photoluminescence spectroscopes to examine the crystallinity and optical property of the samples.

In the paper entitled "*Optical properties and in vitro biological studies of oligonucleotide-modified quantum dots*," Gérard et al. have reported the synthesis and characterizations of a series of new oligonucleotide-modified CdTe quantum dots (QDs); also they have performed *in vitro* test. Xie et al. have reported a review on recent advances in optimizing luminescence properties of doped nanoparticles based on core-shell structure in their paper entitled "*Core-shell structure in doped inorganic nanoparticles: approaches for optimizing luminescence properties*." Luo et al. in the paper entitled "*Luminescent properties of y2o3:eu3+ nanocrystals prepared by molten salt synthesis*" have reported the synthesis, structures, morphologies, and the photoluminescent properties of Y2O3:Eu3+ phosphors. They observed tuning in particle size by using different surfactants and reported red emission under the excitation of UV light of 254 nm. The treatment of water by using the heterogeneous semiconductor photocatalysts has drawn recent attention. However, Sifontes et al. in the paper entitled "*Effect of calcination temperature on structural properties and photocatalytic activity of ceria nanoparticles*

synthesized employing chitosan as template" have reported the synthesis of ceria nanoparticles and degradation of Congo red (CR) dye under the visible light irradiation.

We are very much happy to note the research progress on the techniques of synthesis, characterization, and optical properties of nanostructured materials. Also we are very much hopeful that this special issue will provide the thoughts to the beginners and will be helpful for the potential researchers to start research work in the area of development of the nanoparticles and nanocomposite materials which are required for the future optoelectronic devices.

Acknowledgments

The editors would like to thank and express their appreciations to all authors for their valued contributions and to all potential reviewers for sparing their valuable time, efforts, and constructive comments for this special issue. We are thankful to the Huda Qabeel for her help.

Pathik Kumbhakar
Suprakas Sinha Ray
Andey L. Stepanov