Special Issue

Up- and Down-Conversion Nanoparticles for Light Sources and Theranostics

Message from the Guest Editor

Luminescent crystalline dielectric nanoparticles doped with rare earth ions and nanodiamonds with color optical centers have been attracting attention as a new class of drugs combining properties for both diagnostic and therapeutic effects. They can serve, for example, in diagnosing cancer at the early stages of disease, as well as in localized controlled treatment that is noninvasive for healthy tissues. However, their fluorescence efficiency is still far behind the similar bulk crystals or organic dyes and quantum dots. Finding ways to significantly increase the luminescence efficiency of the rare earth-doped nanoparticles will enable their actual application in bio-imaging. Another prospective research area is related with the ability of nanoparticles to locally heat biotissues under laser excitation, allowing the possibility of them being used as noninvasive high-precision thermal sensors at physiological temperature range. Last, but not least, an important problem to be solved in application is in elimination of the effects of agglomeration of single nanocrystals in aqueous colloidal solutions into aggregates.

Guest Editor

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Message from the Editor-in-Chief

Nanoscience and nanotechnology are exciting fields of research and development, with wide applications to electronic, optical, and magnetic devices, biology, medicine, energy, and defense. At the heart of these fields are the synthesis, characterization, modeling, and applications of new materials with lower nanometer-scale dimensions, which we call “nanomaterials”. These materials can exhibit unusual mesoscopic properties and include nanoparticles, coatings and thin films, metal–organic frameworks, membranes, nano-alloys, quantum dots, self-assemblies, 2D materials such as graphene, and nanotubes. Our journal, *Nanomaterials*, has the goal of publishing the highest quality papers on all aspects of nanomaterial science to an interdisciplinary scientific audience. All of our articles are published with rigorous refereeing and open access.

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