

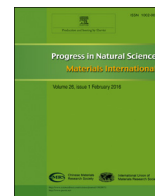
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# Progress in Natural Science: Materials International

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## Preface from guest editors



### 1. Nanomaterials and device

It has been widely accepted that, when a material comes to low dimensions, for example, 0D quantum dots and hetero-nanocrystals, 1D nanowires and nanotubes, 2D nanosheets, and 3D hierarchical or branched nanostructures, the associated physical properties will differ from their bulk counterparts, and subsequently will render enhanced or emergent functions. This has generated a fascinating field of “nanomaterials and devices”. It is a highly multidisciplinary field in nature. A wide range of electronic, photonic, and energy devices made of nanomaterials are being explored. It is no doubt that performance improvement of these devices always requires new nanomaterials with better controlled morphology, composition and surface functionality.

Energy is a particularly popular and timely topic. Vast experiment and simulation data have proven that nanomaterials excel in their bulk counterparts, which has stimulated wide interests in developing high-quality nanomaterials for photovoltaics, batteries and supercapacitors, light-emitting diodes, and fuel cells, as well as photo- and electrocatalysts for water splitting and CO<sub>2</sub> reduction. These energy devices require efficient nanomaterials in order to boost the efficiency and lower the cost, so that they can be industrial viable.

This special issue including two review articles and fifteen original articles contributed by high-level young researchers highlights some recent advances in nanomaterials and devices. Specifically, it covers metal oxides/hydroxides, graphene, and conductive polymers for batteries and supercapacitors and environment remediation, noble metals and transition metals for electrocatalysis, and phosphor nanocrystals for light-emitting diodes.

To put it in perspective, research on nanomaterials and related devices will continue to be driven by new functionalities and new understandings. It is still ultimately essential to achieve cost-effective, high yield synthesis with controllable morphology and dimension. Tailoring the nanoscale structural complexity, surface chemistry, and composition/heterojunction is highly demanded towards high-performance optoelectronic and energy conversion/storage devices. This journal will continue to serve as an excellent platform for rapid publication of high-quality manuscripts in this topic and beyond.



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