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EDITORIAL

Preface for the special issue on fabrication and application of functional materials

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Fabrication of frontier materials, investigation of new properties of emerging materials, and engineering new functionality in these materials have been one of the top priority research field for exploration basic science as well as development of next-generation technology in the twenty-first century. The significant progress made in materials science in the last a few decades enabled novel processing and material characterization methodologies. Artificially tailored materials at nanoscale or even molecular level are now the key drivers in developing many cutting-edge technologies and have attracted a lot of attention in many fields, including physics, chemistry, engineering, biology, and so on. In each of these fields, progress has been aided by a continuous development of novel materials. On the other hand, research and development of new materials as well as their applications have become interdisciplinary activity demanding collaborative researches between material scientists, physicists, chemists, engineers, and biologists.

The special issue on fabrication and application of functional materials for this journal consists of fourteen contributed research papers covering a wide range of topics in materials science, providing up-to-date knowledge and cutting-edge scientific concepts and the state-of-the-art technological developments in the synthesis, modeling, characterization, and application of a broad range of advanced materials. Various types of advanced materials, including bismuth telluride nanostructures, ZnO thin films epitaxially grown on GaN substrates, new organic crystals, nanocrystalline $Fe_{64}Ni_{36}$ thin films, nanosized hydroxyapatite substituted by fluoride and carbonate ions, overlithiated $Li_{1+x}Ni_{0.8}Co_{0.2}O_2$ powders, hot-rolled Nd–Fe–B–Ti–C melt-spun ribbons, sponge-like indium tin oxides, and bio-inspired artificial cilia, have been synthesized and characterized. The relationships between the microstructure and the domain structure were established in Nd–Fe–B magnets to evaluate the effects of the microstructure on the magnetization process. Detailed theoretical modeling and evolution of surface phase transition have also been discussed in this special issue to tackle the challenges of synthesis of novel materials. Novel properties of advanced materials, such as plasmonic nanoparticles and water-containing colloidal crystals, have been investigated and summarized in this special issue. Applications, such as electronic devices, sensors, and energy harvesting devices, based on next generation materials, have also been included. Overall, original theoretical and experimental research articles along with review papers assembled in this special issue covers topics on the fabrication, properties, and applications of frontier materials.

The papers presented in this special issue offers new insights and comprehensive views of some key materials that can be applied to a number of fields, which, therefore, will be great interest to a broad spectrum of researchers and technologists. Outstanding scientists and engineers, from China, France,

Germany, India, Japan, Malaysia, Sweden, and United States, present a wide range of topics including surface science, organic chemistry, thin film growth, electronic devices, nanomaterials, and computational materials science and simulation. We would like to thank all the authors and reviewers who have made this special issue possible. We appreciate the encouragement and help from the editorial team of *Frontiers of Materials Science* throughout the editorial process.

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