Advances in Materials Science and Engineering

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Special Issue on

Multifunctional Oxides for Nanoelectronic and Energy Harvesting Applications

CALL FOR PAPERS

Oxide materials and oxide interfaces, possessing a wide range of multifunctional properties, are becoming increasingly important in information processing and storage systems as well as in energy conversion and storage applications. In addition to the enormous potential in nanoelectronics, spintronics, magnetoelectronics, transparent electronics, photonics, optoelectronics, thermoelectrics, piezoelectrics, ferroelectrics, energy harvesting, and energy storage, the desire to understand the intriguing fundamental physics at the nanoscale level and the challenges associated with nanofabrication still remain the driving force for "all oxide" research and development. Synthesis of multifunctional materials with tailored properties for specific application in a practical device configuration is demanding in terms of structural and processing compatibility. The characterization of these materials in terms of structure-property relations and novel properties associated with the size and shape is an opportunity to fine-tune these properties to specific applications.

The focus of this special issue is on applications of multifunctional oxide materials in advanced technologies like logic and memory devices as well as energy conversion and storage. It covers the processing, fabrication, and integration as well as the structural and functional characterization of nanostructured oxides and oxide-based devices. Bulk materials as well as those with confined dimensionality such as thin films, multilayers and interfaces, rods, and nanoislands/grains are targeted in this issue. Original research as well as expert review articles describing the current state of the art on the topics of this special issue is encouraged.

Potential topics include but are not limited to the following:

- High-k dielectrics for logic and memory devices
- Nanostructured oxide materials
- Synthesis and characterization of new perovskite and spinel oxides
- Spintronics and magnetoelectrics
- Oxide materials for solar energy conversion
- Oxide interface engineering
- Energy storage and rechargeable batteries

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