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Synthesis, Characterization, and Applications of Functional Materials— Thin Films and Nanostructures

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PREFACE

Symposium K, “Nanostructures, Thin Films and Bulk Oxides—Synthesis, Characterization and Applications” and Symposium RR, “Solution Synthesis of Inorganic Functional Materials” were held April 21–25 at the 2014 MRS Spring Meeting in San Francisco, California.

Oxide materials from bulk down to nanostructures are used for applications in microelectronics, communications, sensing, energy, catalysis, nanophotonics, and optoelectronics. As the characteristic dimensions of oxide systems shrink into the nanometer range, there are increased technological challenges for synthesis, processing, and characterization to ensure high uniformity, reproducibility, and cost reduction.

This symposium proceedings volume represents the recent advances in various areas of deposition, processing, characterization, and integration of functional oxide materials, with particular emphasis on the relationship among the structure, composition, stability and functional properties. The papers are divided into three sections: (1) ZnO Thin Films and Nanostructures, (2) Multiferroics, Magnetism, and Magnetic Materials and (3) Oxide Thin Films and Nanostructures. The papers published in this volume provide answers to many scientific questions regarding the role of interfaces, defects, composition, stress and size effects on their properties and functionalities and offer insight into the exciting recent developments occurring in oxide materials from bulk down to nanostructures. We hope that the volume is a valuable tool in guiding and informing the scientific community about new and important advancements happening in the area of oxide materials.

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Maryline Guilloux-Viry
Menka Jain
Quanxi Jia
Hiromitsu Kozuka
Dhananjay Kumar
Sanjay Mathur
Xavier Obradors
Kaushal K. Singh

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