Advances in Bioceramics and Porous Ceramics VII

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Preface

This issue contains the proceedings of the “Next Generation Bioceramics” and “Porous Ceramics: Novel Developments and Applications” symposia of the 38th International Conference and Exposition on Advanced Ceramics and Composites (ICACC'14), which was held from January 26-31, 2014 in Daytona Beach, Florida, USA.

A rapidly growing area of ceramic science & technology involves the development of novel ceramic materials that facilitate the diagnosis and/or treatment of medical conditions. Bioceramics researchers have recently developed several types of bioinspired and biomimetic ceramics, which imitate attributes of materials found in nature. The “Next Generation Bioceramics” symposium addressed several areas associated with processing, characterization, modeling, and applications of bioce-ramic materials. Topics covered by the symposium included processing of advanced bioceramic materials; bioinspired and biomimetic ceramic materials; bio-mineralization; self-assembly of bioceramic materials; inorganic-organic composite materials; nanostructured bioceramic materials; mechanical properties of bioceram-ic materials; in vitro and in vivo characterization of bioceramic materials; bioce-ramic materials for drug delivery; bioceramic materials for gene delivery; bioce-ramic materials for sensing; and bioceramic materials for dental applications. This symposium facilitated numerous productive discussions among various groups in the bioceramics community, including academic researchers, industrial researchers, governmental researchers, and graduate students.

There is an increasing need for components possessing designed porosity for various applications in several key

areas such as environmental control, energy, defense and healthcare. In the “Porous Ceramics” symposium, the speakers discussed how they can tailor the characteristics of the porosity embedded in ceramic parts, including the total porosity, the average cell size, the cell size distribution, and the degree of interconnectivity among the cells. Papers on a wide range of topics were given, such as innovations in processing methods, including automated manufacturing, structure and properties, modeling and novel characterization tools, mechanical behavior, micro- and meso-porous ceramics, ceramic membranes, and applications of porous ceramics. The sessions were well attended and there was lively discussion after each presentation, confirming the large interest that exists in the ceramics community, both in academia and in industry, for porous ceramics because of their unusual characteristics and widespread applicability.

We would like to thank the staff at The American Ceramic Society, including but not limited to Greg Geiger, Mark Mecklenborg, Marilyn Stoltz, and Marcia Stout, for making this proceedings volume possible. We would like to thank Anita Lekhwani and her colleagues at John Wiley & Sons for their support of this volume. We would also like to acknowledge the efforts of the authors and reviewers, without whom this volume would have not been possible. We also thank the leadership of the Engineering Ceramics Division of The American Ceramic Society, including Andrew Gyekenyesi, Sanjay Mathur, Tatsuki Ohji, Dileep Singh, Mrityunjay Singh, Sujanto Widjaja, and the 2014 Program Chair, Michael Halbig, for their tireless efforts. We hope that this volume becomes a useful resource for academic and industrial efforts involving porous ceramic materials and bioceramic materials. Finally, we hope that this volume facilitates advances in ceramic science &