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Journal of
MATERIALS RESEARCH

FOCUS ISSUE · JULY 2018

Submission Deadline—February 1, 2018



CALL FOR PAPERS

3D Printing of Biomaterials

3D printing or additive manufacturing is a transformative technology platform that is impacting various disciplines including biomaterials and biomedical devices. This Focus Issue will capture the perspectives of professionals from different disciplines including science, engineering, and medicine towards application of 3D printing in biomaterials. More specifically, the topic will be geared towards understanding of structure–process–property relationships involving different materials under *in vitro*, *in vivo* and *in silico* environments.

Suggested Topical Areas include, but not limited to

- ◆ 3D printing of biomaterials
- ◆ Surface modification via 3D printing
- ◆ Drug delivery from 3D printed scaffolds
- ◆ Bioprinting
- ◆ Texture and microstructure in 3D printed devices
- ◆ Mechanical properties of 3D printed materials
- ◆ Process development for 3D printed devices
- ◆ Modeling and simulation involving 3D printed biomaterials and devices
- ◆ Patient specific devices

GUEST EDITORS

Susmita Bose, Washington State University, USA

Amit Bandyopadhyay, Washington State University, USA

MANUSCRIPT SUBMISSION

To be considered for this issue, new and previously unpublished results significant to the development of this field should be presented. The manuscripts must be submitted via the *JMR* electronic submission system by **February 1, 2018**. Manuscripts submitted after this deadline will not be considered for the issue due to time constraints on the review process. Please select “Focus issue: *3D Printing of Biomaterials*” as the manuscript type. **Note our manuscript submission minimum length of 6000 words, with a maximum of 6-8 figures. Review articles must be pre-approved by proposal to the Editor-in-Chief. The proposal form and author instructions may be found at www.mrs.org/jmr-instructions.** All manuscripts will be reviewed in a normal but expedited fashion. Papers submitted by the deadline and subsequently accepted will be published in the Focus Issue. Other manuscripts that are acceptable but cannot be included in the issue will be scheduled for publication in a subsequent issue of *JMR*.

jmr@mrs.org

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Journal of
MATERIALS RESEARCH
FOCUS ISSUE · SEPTEMBER 2018

Submission Deadline—February 1, 2018



CALL FOR PAPERS

Interconnect and Interface Materials for High-Temperature Energy Conversion Technologies

One major roadblock to the wide-scale commercialization of state-of-the-art energy materials (e.g., SOFC, high-temperature PV, and high-temperature thermoelectrics) is the great difficulty involved with interfacing these materials with electrical interconnects in a way that results in low parasitic electrical losses and low degradation rates. Many of these materials consist of reactive and sometimes volatile elements from the chalcogen (including oxygen), pnictogen, and halogen groups, which tend to react strongly with metallic interconnect and interface materials that are usually desired for low Ohmic losses at the device level.

This *JMR* Focus Issue will cover advances in the synthesis, processing, and performance of both conventional alloys and unconventional compounds designed for use as electrical interconnects and interfacing materials for these high-temperature energy conversion technologies. Special attention may be given to work relating to experimental and theoretical assessment of the reaction and diffusion kinetics of these interface materials and the volatile, reactive species of energy materials.

Manuscripts are solicited in the following areas:

- ◆ Development and performance of *in-situ*-formed diffusion barriers
- ◆ Modeling of high-temperature interface evolution (kinetics and properties evolution)
- ◆ Reaction kinetics of volatile “p-block” elements with transition metals and alloys
- ◆ Mechanical properties of interconnect-energy material interfaces
- ◆ Interface degradation mechanisms and mitigation
- ◆ Characterization and improvement of electrical and thermal contact/interface resistance

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Submission Deadline—March 1, 2018

Fundamental Understanding and Applications of High-Entropy Alloys

As an emerging field, research on high-entropy alloys now has attracted rising worldwide attention and interest from both academia and industry since 2004. The number of published papers increases rapidly each year, and there have been many dedicated conference symposia and workshops on high entropy alloys. Traditional physical metallurgy principles as well as novel processing methods have all been applied to high entropy alloys, and new materials with extraordinary properties have been reported. The high-entropy concept has been extended to ceramics, semiconductors, polymers, superconducting materials, etc. As a result, the field has advanced dynamically and rapidly in almost every aspect of materials science. This *JMR* Focus Issue will provide readers up-to-date information on high-entropy alloys regarding their fundamentals (e.g., formation, thermodynamics, kinetics, structures, defects, mechanical properties, functional properties, environmental properties) and applications (e.g., structural materials, coatings, nuclear materials, high-temperature materials).

Contributed papers are solicited in the following areas:

- ◆ Thermodynamics: Phase diagrams, phase transformations (e.g., at high temperature and/or high pressure), thermochemistry measurements
- ◆ Kinetics: Diffusivities, high throughput diffusion multiples
- ◆ Computational modeling: First-principles, molecular dynamics, Monte Carlo, phase field, finite element methods, CALPHAD, continuum, empirical parameters, machining learning
- ◆ Defects: Vacancies, dislocations, stacking faults, twinning, grain boundaries, interfaces, surfaces
- ◆ Processing: Homogenization, additive manufacturing, rapid solidification, grain refinement, powder metallurgy
- ◆ Microstructure characterization: Neutron, synchrotron and x-ray scattering, transmission electron microscopy (TEM), high-resolution TEM, in situ TEM, atom-probe tomography
- ◆ Mechanical properties: Elasticity, plasticity, fracture, wear, creep, fatigue, high strain rate, nanoindentation
- ◆ Environmental properties: Corrosion, oxidation, irradiation
- ◆ Other high-entropy materials, such as oxides, carbides, borides, polymers, compounds

GUEST EDITORS

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Peter K. Liaw, The University of Tennessee, USA

Daniel B. Miracle, Air Force Research Laboratory, USA

MANUSCRIPT SUBMISSION

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The Society's interdisciplinary approach to the exchange of technical information is qualitatively different from that provided by single-discipline professional societies because it promotes technical exchange across the various fields of science affecting materials development. MRS sponsors two major international annual meetings encompassing many topical symposia, as well as numerous single-topic scientific meetings each year. It recognizes professional and technical excellence, conducts tutorials, and fosters technical exchange in various local geographical regions through Section activities and Student Chapters on university campuses.

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Cambridge University Press
One Liberty Plaza, 20th Floor,
New York, NY 10006

A publication of the
MRS MATERIALS RESEARCH SOCIETY
Advancing materials. Improving the quality of life.

Periodical Rate Postage Paid at New York, NY
and Additional Mailing Offices

ISSN: 0884-2914