

Submission Deadline—July 1, 2018



Understanding Water-Oxide Interfaces to Harness New Processes and Technologies

The 2017 U.S. Department of Energy Basic Research Needs report acknowledged the relevance of gaining an understanding of “chemical processes and materials underlying the interdependence of energy and water,” with an underlying question on “the affinity and reactivity at interfaces in aqueous systems.” Water adsorption, water film formation, and water-mediated reactions on metal oxide interfaces are fundamentally important processes in environmental chemistry, catalysis, and processing of materials, as well as for the control and performance of functional nanocrystalline oxides. With increasing water content, the adsorption layer covering surfaces evolves from a solid/vacuum interface to a solid/bulk liquid one. This transition is associated with a radical increase in the level of complexity with regards to the physical-chemical description of the materials system which is not fully understood.

This JMR Focus Issue will provide readers up-to-date information on the impact of thin water films – and the confinement of related interfaces – on structure, stability, and transformation behavior of oxide materials from different perspectives spanning materials sciences, thermodynamics, catalysis, and geochemistry.

Contributing papers are solicited in the following areas:

- ◆ Water adsorption and the stability of water-nanomaterials interfaces
- ◆ The effect of water on densification and growth of oxide structures
- ◆ Dissolution recrystallization processes during materials synthesis and sintering
- ◆ Oriented attachment and water-assisted self-assembly of oxide nanostructures
- ◆ Water film induced activation of oxide (electro-photo) catalysts
- ◆ Geochemical processes mediated by thin water films
- ◆ Experimental challenges in description of thin water films
- ◆ Thermodynamics at water-oxide interfaces
- ◆ Advances in modeling and simulation of water adsorption and film formation

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To be considered for this issue, new and previously unpublished results significant to the development of this field should be presented.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 **July 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: *Understanding Water-Oxide Interfaces to Harness New Processes and Technologies*” as the Focus Issue designation. **Note our manuscript submission minimum length of 3250 words, excluding figures, captions, and references, with at least 6 and no more than 10 figures and tables combined. Review articles may be longer but must be pre-approved by proposal to the Guest Editors via jmr@mrs.org. 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*.

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CALL FOR PAPERS

Submission Deadline—April 1, 2018



Catalytic Engineered Materials for Commercial and Industrial Energy Applications

Environmental pollution due to combustion of fossil fuels and other chemical energy components has been a major worldwide challenge for decades, leading to extensive energy research with mainstays of upgrading bitumen and coal, and hydro-processing fuels. Refining processes that exploit the efficiency and long life span of catalytic materials can (1) lower the high content of heterogeneous atoms such as sulfur and other pollutants, (2) improve methane reforming, and (3) enhance water splitting efficiency. Editors for this JMR Focus Issue invite the materials community to share research on catalytic materials as a fundamental pillar in the development of fuel components, including commercial liquid fuels, hydrogen production and methane reforming as detailed below.

Contributed articles are sought in the following areas:

- ◆ Computer assisted density functional theory simulations
- ◆ Novel chemistry methods of synthesis (e.g., Fischer-Tropsch, hydrogenation, hydrothermal, sol-gel, etc.)
- ◆ Characterization including *in-situ*, *operando*: UV-vis, HRTEM, SEM and XRD
- ◆ Fabrication, integration, and scaling
- ◆ Industrial commercialization and energy production

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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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