

EDITORIAL

S. V. S. Narayana Murty¹ and Richard W. Neu²

Editorial: Special Issue on Materials for Extreme Environments, Part 2

Reference

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¹ Materials and Metallurgy Group, Vikram Sarabhai Space Centre, Trivandrum, India (Corresponding author), e-mail: narayanamurty_susarla@vssc.gov.in

² George W. Woodruff School of Mechanical Engineering, Georgia Institute of Technology, Atlanta, GA, USA

The response of materials to extreme conditions of heat flux, stresses, strain rates, and corrosive environments provides an insight into new phenomena, reveals failure modes that limit technological possibilities, and presents novel routes for making new and improved materials. Exposing materials to extreme environments induces new physical phenomena, which are central to the challenges of science. Understanding and exploiting these extreme environments is critical for facing many of the future energy challenges, as materials for these usually operate at extremes of pressure, temperature, and chemical reactivity. Identifying materials that not only survive but also perform under extreme conditions to the design requirements is a major concern in energy research. It is in this context that this special issue on materials for extreme environment becomes relevant and useful for readers in their research endeavors.

It has been a pleasure to be guest editors for the two-part special issue on Materials for Extreme Environments for *Materials Performance and Characterization*. The first part of special issue covered 16 papers, essentially covering the areas of materials for cryogenic applications and ultrahigh temperature, advanced materials, and manufacturing technologies. The second part of the special issue contains the remaining 18 papers, essentially showcasing recent advances in materials for energy applications.

There are two review articles in this volume. The first is by Prasad Reddy et al. from the Indira Gandhi Centre for Atomic Research, India, on "Core Materials for Sodium Cooled Fast Reactors: Past to Present and Future Prospects," which reviews materials that are subjected to extreme conditions of intense fast-spectrum neutron irradiation, high temperatures, and mechanical/chemical fuel-cladding interactions. The second article, by Patil et al., "A Review on the Material Development and Corresponding Properties for Power Plant Applications," brings out the recent advances in materials for power plants. These are followed by six papers each on corrosion/oxidation and welding of advanced materials for use in extreme environments.

We sincerely thank both the authors and reviewers for their hard work and dedication. We wholeheartedly thank the ASTM International staff dealing with the special issues for all their efforts.

We sincerely hope that you enjoy the papers in this special issue.