

Introduction: Processes and Performance in Harsh Environments

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Materials used at elevated temperatures are required to have both excellent mechanical properties and oxidation/corrosion resistance. These tend to be opposing properties from the standpoint of alloying, which presents technical challenges to the extent that there is an ever increasing need to understand better the fundamental issues affecting optimal design of high-temperature materials. Indeed, recent demands for improved energy savings, reduced environmental pollution, and decreased emissions of CO₂ and other greenhouse gases impose the need for further advancements in high-temperature materials.

A series of specialized meetings entitled, *International Symposium on High-Temperature Oxidation and Corrosion (ISHOC)*, has been held regularly in Japan since 2000. The fourth of these meetings was ISHOC-2014, which was held in the northern city of Hakodate on July 23–27, 2014. The main objective of the ISHOC series is to address current issues of high-temperature materials used in harsh service environments. This includes providing further elucidation of fundamental mechanisms governing a particular mode of degradation and guiding technical solutions for arriving at improved materials. At ISHOC-2014 there was participation

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by a total of 154 scientists. Of that number, 92 were from Japan and 62 were from 15 different countries. A number of attendees were encouraged to submit a paper based on their presentation for publication in one of two topical special issues of *Oxidation of Metals*:

- I. Processes and performance in harsh environments.
- II. High-temperature corrosion in energy-related systems.

It is our pleasure to present papers on Topic I in this particular issue of *Oxidation of Metals*. The papers are by leading researchers in the field of high temperature corrosion and, as Guest Editors, we believe that each paper will serve as a great resource in years to come.