

Simulating Unique High Temperature Corrosion
Environments

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High-temperature corrosion of metals and ceramics is ubiquitous in modern industry.

Complex and dynamic chemically-aggressive service environments can degrade components and lead to system failures.

Laboratory simulation of these environments is critical for mechanistic understanding of degradation phenomena, as well as to inform materials selection.

This presentation will review efforts to accurately and precisely control experimental conditions in order to create meaningful facsimiles of industrial applications in the laboratory. Specifically, efforts to reproduce corrosive environments observed in solid oxide fuel cell stacks, turbine engines and silicon refining systems will be presented and discussed.

Challenges and opportunities for high-temperature materials scientists and engineers will be summarized in the context of mainstay and emerging industrial applications.