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Editorial on this Focus Issue on Key Corrosion Topics

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This focus issue explores a number of current topics in high-temperature oxidation, some that have been of interest for many decades and others with more recent origins. For example, Griffith and Pfeil's 1937 patent for rare earth additions such as Y and Sc to Ni–Cr alloys is nearly 85 years old, and we still continue to study minor alloy additions (including Hf) and aspects of Ni–Cr alloy performance because of their technological importance to many industrial applications. The alloys in this issue range from low-alloy steels to superalloys and shape-memory alloys. The experiments are often complex, as environments such as steam, CO₂ and molten salts are being considered for current and future applications. In some cases,

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coatings may be required for use in the extreme environments of turbines or solid oxide fuel cells. Modeling is incorporated to gain more insight with examples studying coating failure mechanisms and multilayer reaction products. Microstructure is a critical aspect including its impact on oxidation resistance but also the impact of oxidation on mechanical properties. Finally, test parameters are explored including the effect of thermal cycling on hot corrosion and the effect of gas pressure and the reaction tube material on oxidation behavior.

The following papers stem from presentations that were given at the 10th International conference on High Temperature Corrosion and Protection of Materials (HTCPM2021), which was delayed because of COVID-19 and held virtually on March 29–April 2, 2021.

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