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MATERIALS DESIGN

Gamma (FCC)/Gamma-Prime (L12) Co-Based Superalloys III

The report of a stable '-L12 phase in the ternary Co-Al-W system in 2006 has given rise to significant research on a new class of precipitation strengthened alloys, analogous to Ni-based superalloys which are often utilized in high temperature turbine engine components. Since the initial discovery, a myriad of Co- and CoNi-based alloy compositions have been developed with proposed applications ranging from high pressure turbine blades to compressor disks. However, significant challenges still exist for commercial transition of these new alloys, including increasing the '-solvus, improving oxidation resistance, characterizing fatigue resistance, and establishing processing windows.

This symposium continues in the tradition of the first two TMS symposia on -' Co-based superalloys (held in 2014 and 2017) to bring together the growing community of researchers involved with developing '-strengthened Co-based superalloys for high temperature and other applications. Experimental and computational investigations on Co- and CoNi-based alloys that focus on understanding materials response, use ICME-based approaches, or aid in rapid alloy development will be highlighted.

Topics of interest include:

- strategies for increasing the ' solvus temperature
- improving environmental resistance
- evaluating high temperature mechanical performance
- assessing phase stability and phase transformation mechanisms
- advancing processing methods of these promising new materials

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