

Using In-situ Neutron Diffraction to Investigate Deformation Mechanism of CoCrFeMnNi High Entropy Alloy under Low Cycle Fatigue

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In this paper, the deformation mechanism of cobalt-chromium-iron-manganese nickel high-entropy alloys with different grain sizes under low-cycle fatigue is investigated, and the lattice strain, dislocation density, SFP and TWP can be derived from successive peak shape variations by real-time neutron diffraction experiments. In addition, the macroscopic behavior can be divided into three stages from the macroscopic stress vs. cycle number diagram, and the dominant microstructure of the different stages can be derived from the peak profile analysis.

Keywords: CoCrFeNiMn, grain size effect, low cycle fatigue