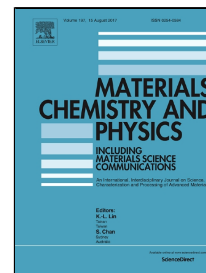


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Effects of homogenization temperature on cracking during cold-rolling of $\text{Al}_{0.5}\text{CoCrFeMnNi}$ high-entropy alloy

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Abstract

In this work, the effects of homogenization annealing temperature of $\text{Al}_{0.5}\text{CoCrFeMnNi}$ HEA on cracking during cold-rolling were investigated. AlNi B2 phases were formed by low-temperature homogenization and affected the cracking phenomenon during cold-rolling. X-ray diffraction, microstructure, and composition analyses and thermodynamic calculations were conducted to identify the crystal structure of the alloy after the homogenization annealing treatment. The phase fraction and hardness of the homogenized alloy confirmed that the formation of the AlNi B2 phase induces cracking during cold-rolling of the $\text{Al}_{0.5}\text{CoCrFeMnNi}$ alloy. High-temperature annealing for homogenization of the alloy is recommended to prevent cracking during cold-rolling.

Keywords: High-entropy alloy (HEA), Cracking phenomenon, X-ray diffraction (XRD), Thermodynamic calculation, Hardness

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