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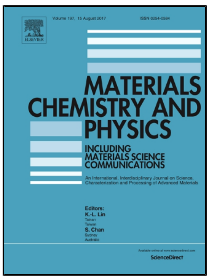

Effects of homogenization temperature on cracking during cold-rolling of $Al_{0.5}$ CoCrFeMnNi high-entropy alloy

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PII:	S0254-0584(17)30485-6
DOI:	10.1016/j.matchemphys.2017.06.043
Reference:	MAC 19783
To appear in:	*Materials Chemistry and Physics*
Received Date:	04 April 2017
Revised Date:	23 May 2017
Accepted Date:	19 June 2017

Please cite this article as: Jongun Moon, Jae Wung Bae, Min Ji Jang, Seung Mi Baek, Dami Yim, Byeong-Joo Lee, Hyoung Seop Kim, Effects of homogenization temperature on cracking during cold-rolling of $Al_{0.5}$CoCrFeMnNi high-entropy alloy, *Materials Chemistry and Physics* (2017), doi: 10.1016/j.matchemphys.2017.06.043

Effects of homogenization temperature on cracking during cold-rolling of $Al_{0.5}CoCrFeMnNi$ high-entropy alloy

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Abstract

In this work, the effects of homogenization annealing temperature of $Al_{0.5}CoCrFeMnNi$ 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 $Al_{0.5}CoCrFeMnNi$ 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