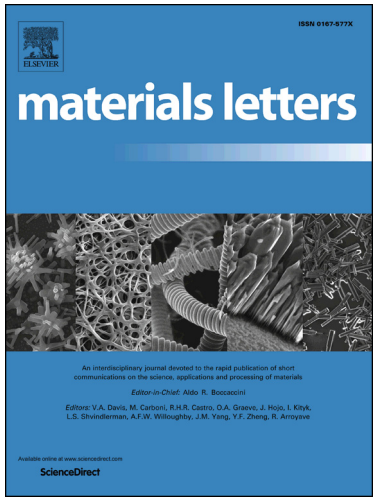

Friction stir welding of a $CoCrFeNiAl_{0.3}$ high entropy alloy

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Abstract

A typical face-centered cubic $CoCrFeNiAl_{0.3}$ high entropy alloy was welded by friction stir welding. Sound joints without welding defects were obtained. Four typical regions, the stir zone, thermomechanically affected zone, heat affected zone and base metal could be detected. The stir zone showed a refined equiaxed microstructure due to recrystallization and it exhibited the highest hardness with grain refinement. The grain size decreased slightly with increasing the welding speed. The thermomechanically affected zone exhibited a mixed microstructure comprising coarse and fine grains due to partial recryatllization. The present result shows a potential capability for joining high entropy alloys through friction stir welding and may enhance their engineering applications.

Keywords: High entropy alloys; Friction stir welding; Microstructure; Hardness.

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