

Effect of Aluminium Content on Bending Properties and Microstructure of $Al_xCoCrFeNi$ Alloy Fabricated by Induction Melting

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Abstract : High-entropy alloys (HEAs) have gained significant attention due to their great potential as functional and structural materials. HEAs have very good mechanical properties (in particular, alloys based on CoCrNi). They also show the ability to maintain their strength at high temperatures, which is extremely important in some applications. AlCoCrFeNi alloy is one of the most studied high-entropy alloys. Scientists often study the effect of changing the aluminum content in this alloy because it causes significant changes in phase presence and microstructure and consequently affects its hardness, ductility, and other properties. Research conducted by the authors also investigates the effect of aluminium content in $Al_xCoCrFeNi$ alloy on its microstructure and mechanical properties. $Al_xCoCrFeNi$ alloys were prepared by vacuum induction melting. The obtained samples were examined for chemical composition, microstructure, and microhardness. The three-point bending method was carried out to determine the bending strength, bending modulus, and conventional bending yield strength. The obtained results confirm the influence of aluminum content on the properties of $Al_xCoCrFeNi$ alloy. Most studies on $Al_xCoCrFeNi$ alloy focus on the determination of mechanical properties in compression or tension, much less in bending. The achieved results provide valuable information on the bending properties of $Al_xCoCrFeNi$ alloy and lead to interesting conclusions.

Keywords : bending properties, high-entropy alloys, induction melting, microstructure

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