

Microstructural Characterization and Mechanical Properties of Al-2Mn-5Fe Ternary Eutectic Alloy

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Abstract : Al-2Mn-5Fe eutectic alloy (wt.%) was prepared in a graphite crucible under vacuum atmosphere. The samples were directionally solidified upward at a constant temperature gradient in four different of growth rates by using a Bridgman method. The values of eutectic spacing were measured from longitudinal and transverse sections of the samples. The dependence of eutectic spacing on the growth rate was determined by using linear regression analysis. The microhardness and tensile strength of the studied alloy also were measured from directionally solidified samples. The dependency of the microhardness and tensile strength for directionally solidified Al-2Mn-5Fe eutectic alloy on the growth rate were investigated and the relationships between them were experimentally obtained by using regression analysis. The results obtained in present work were compared with the previous similar experimental results obtained for binary and ternary alloys.

Keywords : eutectic alloy, microhardness, microstructure, tensile strength

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