

Influence of the Growth Rate on Eutectic Microstructures and Physical Properties of Aluminum-Silicon-Cobalt Alloy

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Abstract : Al-12.6wt.%Si-2wt.Co alloy was prepared in a graphite crucible under vacuum atmosphere. The samples were directionally solidified upwards with different growth rate at constant temperature gradient using by Bridgman-type growth apparatus. The values of microstructures (λ) was measured from transverse sections of the samples. The microhardness (HV), ultimate tensile strength (σ) and electrical resistivity (ρ) of the directional solidification samples were also measured. Influence of the growth rate and spacings on microhardness, ultimate tensile strength and electrical resistivity 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 : directional solidification, Al-Si-Co alloy, mechanical properties, electrical properties

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