

عنوان مقاله:

Microstructure and Grain Refining Performance of a New Al-Ti-C Master Alloy

محل انتشار:

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خلاصه مقاله:

Control of microstructure features that affect the Al-Ti-C master alloys grain refining efficiency is leading to improve the aluminum grain refinement. This study has been done to find the solute effect theory to produce new Al-Ti-C master alloys to get more possibility to control these features. The produced master alloys were examined by scanning electron microscopy (SEM), energy-dispersive spectroscopy (EDS), and X-ray diffraction (XRD); also, the influence of them on pure aluminum was studied. Produced Al-6Ti-1C master alloy contained Ti and TiC particles in the aluminum matrix and Al-4Ti-1C contained TiC particles in the aluminum matrix. As the result, the produced Al-6Ti-1C master alloy is a more efficient grain refiner for pure aluminum as compared to the Al-4Ti-1C. This confirms the influence of Ti particles for grain refinement. The results showed that Al-6Ti-1C master alloy had maximum grain refining performance with 2 minutes holding time, at 983 oK temperature, and 1% wt master alloy addition. Finally, a new Al-Ti-C master alloy with excellent refinement has been prepared successfully

کلمات کلیدی:

Al-Ti-C Master Alloy, Grain Size, Solute Effect Theory

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