عنوان مقاله:

Effects of Solution Heat Treatment on the Microstructure and Tensile Properties of Al-15wt.%Mg2Si-5wt.%Zn Metal Matrix Composite Containing 0.5%Ni

محل انتشار:

دومین همایش بین المللی و هفتمین همایش مشترک انجمن مهندسی متالورژی ایران و انجمن علمی ریخته‌گری ایران (سال: 1392)

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خلاصه مقاله:

This study was carried out to investigate the effects of solution heat treatment on the microstructure and tensile properties of cast Al-15Mg2Si-5Zn metal matrix composite (MMC) containing 0.5wt%Ni. Microstructural examinations were assessed by the use of optical microscope (OM), scanning electron microscope (SEM) and energy dispersive spectroscopy (EDS). It was found that addition of 0.5 wt.% Ni has a strong effect on the size of primary Mg2Si particles. It decreases the size of the particles from 40 μm to 16 μm which shows 60% improvement. This progress enhances both UTS and elongation values of the material from 260 MPa to 290 MPa and 2.5% to 5.2% respectively. Further results revealed that solution heat treatment dissolves Zn-rich intermetallics which were segregated at the grain boundaries. This mainly improves the elongation value up to 6.5% in the MMC containing 0.5 wt.% Ni after solutionizing. The study of the fracture surfaces of the heat treated specimens revealed fine dimples which are the main characteristic of ductile fracture mode

کلمات کلیدی:

Metal matrix composites (MMCs); Mechanical properties; Microstructure