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Effects of Strain-Induced Melt Activation Process on the Structure and Morphology Mg_2Si in Al-15%Mg_2Si Composite

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Abstract : The effect of deformation on the semisolid microstructure and degree of globularity of Al–15%Mg_2Si composite produced by the strain induced melt activation (SIMA) process was studied. Deformation of 25% was used. After deformation, the samples were heated to a temperature above the solidus and below the liquidus point and maintained in the isothermal conditions at three different temperatures (560, 580 and 595 °C) for varying time (5, 10, 20 and 40 min). The microstructural study was carried out on the alloy by the use of optical microscopy. It was observed that strain induced deformation and subsequently melt activation has caused the globular morphology of Mg_2Si particles. The results showed that for the desired microstructures of the alloy during SIMA process, the optimum temperature and time are 595 °C and 40 min respectively.

Keywords : deformation, semisolid, SIMA, Mg_2Si phase, modification
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