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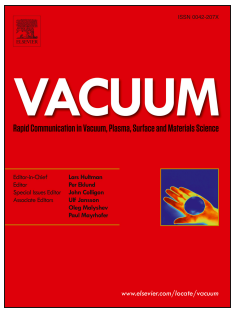

Effects of reheating temperature and isothermal holding time on the morphology and thixo-formability of SiC particles reinforced AZ91 magnesium matrix composite

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Abstract

SiC particles (SiC_p) reinforced AZ91 magnesium (Mg) matrix composite manufactured by stir casting and hot extrusion was as starting material in a series of reheating-isothermal holding experiments and thixo-compression tests. Semisolid slurries composed of α-Mg grains and SiC_p surrounded by liquid phase were obtained by heating the starting material to its semisolid temperature. Coalescence of α-Mg grains and coarsening of liquid phase occurred during further isothermal holding. α-Mg, SiC_p, and liquid phase exhibited different forming behaviors in thixo-compressions. More and wider paths for outflow of liquid were formed in the semisolid slurry held at higher reheating temperature isothermally for a longer time. SiC_p flowed outward together with the liquid phase through these paths during compression and resulted in segregations of liquid phase and SiC_p in the compressed specimen.