

Microstructure and Mechanical Behaviour of Stir-Cast Al-Mg-Si Alloy Matrix Hybrid Composite Reinforced with Corn Cob Ash and Silicon Carbide

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Abstract

In this present study, the microstructural and mechanical behaviour of Al-Mg-Si alloy matrix composites reinforced with silicon carbide (SiC) and Corn cob ash (An agro-waste) was investigated. This research work was aimed at assessing the suitability of developing low cost- high performance Al-Mg-Si hybrid composite. Silicon carbide (SiC) particulates added with 0,1,2,3 and 4 wt% Corn cob ash (CCA) were utilized to prepare 10 wt% of the reinforcing phase with Al-Mg-Si alloy as matrix using two-step stir casting method. Microstructural characterization, density measurement, estimated percent porosity, tensile testing, and micro-hardness measurement were used to characterize the composites produced. From the results obtained, CCA has great potential to serve as a complementing reinforcement for the development of low cost-high performance aluminum hybrid composites.

Keywords: mechanical behaviour, microstructure, corn cob ash, hybrid composite, stir-cast

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