

Processing and characterisation of particulate reinforced aluminium silicon matrix composite

ABSTRACT

Purpose: This paper describes and discusses the processing and characterization of quartz particulate reinforced aluminium-silicon alloy matrix composite. **Design/methodology/approach:** In this regard, quartz-silicon dioxide particulate reinforced LM6 alloy matrix composites were fabricated by carbon dioxide sand molding process with different particulate volume fraction. Tensile tests and scanning electron microscopic studies were conducted to determine the maximum load, tensile strength, modulus of elasticity and fracture surface analysis have been performed to characterize the morphological aspects of the test samples after tensile testing. **Findings:** Hardness values are measured for the quartz particulate reinforced LM6 alloy composites and it has been found that it gradually increases with increased addition of the reinforcement phase. The tensile strength of the composites decreases with the increase in addition of quartz particulate. **Research limitations/implications:** The results allows to determine the structure and properties of the aluminium silicon matrix composite materials. **Originality/value:** In addition, this research article is well featured by the particulate-matrix bonding and interface studies which have been conducted to understand the processed composite materials mechanical behavior and it was well supported by the fractographs taken using the scanning electron microscope (SEM).

Keyword: Mechanical properties; Quartz particulate; LM6 alloy; Fractograph; Hardness; Interfacial bonding