

Determination of Hardness and Tensile Strength of Aluminium Metal Matrix (AMM) Composite using Periwinkle and Palm Kernel Shells Particles as Reinforcements

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Abstract

This study was designed to determine the hardness and tensile strength of aluminium metal matrix (AMM) composite by using periwinkle and palm kernel shell particles as reinforcements. The percentage composition by weight of reinforcement particles in the matrix was determined using central composite design (CCD) of the response surface methodology (RSM). The different compositions obtained from the design of experiment were used to fabricate specimen that were tested in the laboratory for tensile strength and hardness. Control of experiment specimens were also fabricated which contained 100% pure aluminium ingot. Microstructural analyses were carried out on all the specimens using optical metallurgical microscope. The results showed that the reinforcement particles increased both the tensile strength and hardness of the composite. The reinforcement particles increased the tensile strength of the pure ingot by 30.59% when compared to the value of 73.99MPa that was obtained for the control specimen while the hardness was increased by about 318.82%.

Keywords: Aluminium Metal Matrix; Hardness; Tensile Strength; Stir Casting.

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