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ABSTRACT

This study focuses on the microstructure and mechanical properties while incorporating zirconium oxide and coconut shell ash particles in Al 6082 matrix composites. Zirconium oxide and coconut shell ash particles were varied from 0 to 10% and fabricated by stir casting process. The fabricated composites were subjected to X-ray diffractometer and SEM to confirm the presence of zirconium oxide and coconut shell ash particles. Hardness, density, impact strength, tensile strength, ductility and flexural strength analysis were carried on the developed hybrid composites to study the mechanical properties of composites. Scanning electron microscopy study were carried on the fractured tensile and impact test specimen to analyse the fracture mechanism.

KEY WORDS: Mechanical properties, Zirconium oxide, Coconut shell, aluminium, hybrid composite.

1. INTRODUCTION

Metallic Matrix Composites (MMCs) reinforced with ceramic particles having outstanding properties like high strength, low density, high fatigue resistance, high stiffness and superior wear resistance has the potential to replace conventional alloys in defence, automotive, marine and aerospace applications [1]. Hybrid composites containing two or more reinforcements have the potential to meet the demands of advanced engineering applications. The ability of these composite materials depends on selecting the appropriate combination of matrix and reinforcement materials and the processing parameters [2]. Michael et al. [3] reported that industrial wastes like red mud, fly ash and typical agro wastes