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# Study of Wear Characteristics of Hematite Reinforced Aluminum Metal Matrix Composites

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## Abstract

Metal Matrix Composites (MMCs) are used in aerospace, transport, automotive, marine engineering due to their light weight with improved strength, stiffness and wear resistance. Wear is one of the reasons for the failure of the machine components. It is difficult to accurately predict the life of components due to wear, because, generally the wear rates are largely scattered. An attempt is made to study the Wear characteristics of Hematite (Fe<sub>2</sub>O<sub>3</sub>) reinforced Aluminum 6061 Metal Matrix Composites. The reinforcement is added in particulate form of 40-45 μm with an increment of 2% from 0% to 8% (by weight). Composites are fabricated by liquid metallurgy technique. The Microstructural study on as cast Al6061-Fe<sub>2</sub>O<sub>3</sub> composites reveals uniform distribution of reinforcement particles. The wear test was conducted on the specimens by varying speed from 200 – 400 rpm & load from 50 – 100 N. The wear rate was measured by the weight loss of the specimen. The results show that there is an increase in the wear resistance with increase in percentage of reinforcement. The wear factor has decreased 30 - 40 % at 8 % of reinforcement as compared to base matrix material.

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## 1. Introduction

Composite materials have numerous advantages over conventional monolithic materials. The Tensile Strength.

Hardness, Strength to weight ratio and various other mechanical properties are enhanced by the addition of reinforcements in the forms of fiber, whiskers and particles [1-2]. The development of Metal Matrix Composites (MMCs) has emerged as one of the major innovations in materials science in recent years. In MMCs, a metal as

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