

## Abstract

Tremendous interest in graphene as underpinning of essence matrix is drawn due to its excellent mechanical parcels coupled with outstanding thermal and electrical parcels. 0.5 wt graphene nanoplatelets (GNPs) corroborated pure Al mixes were fabricated by greasepaint metallurgy. Goods of microstructure on both mechanical and physical parcels are anatomized totally. GNPs were completely smoothed after mechanical shifting [1]. The Raman spectroscopy results of GNPs verified the disfigurement repairing during compound maquillages medication. After hot extrusion, the scanning electron microscope results presented that GNPs distributed slightly in Al matrix. Aluminum

**Key words:** Graphene; Aluminum matrix; Mechanical properties; Microstructure; Raman spectroscopy

## Introduction

Graphene, a single layer of carbon atoms arranged in a hexagonal lattice, has attracted significant attention due to its exceptional mechanical, electrical, and thermal properties. It is considered a promising material for various applications, including composites, electronics, and energy storage. In this study, we focus on the fabrication of Al matrix composites reinforced with 0.5 wt% graphene nanoplatelets (GNPs) using greasepaint metallurgy. The goal is to analyze the microstructure and mechanical/physical properties of these composites. The results show that GNPs are completely smoothed after mechanical shifting [1]. Raman spectroscopy results of GNPs verified the disfigurement repairing during compound maquillages medication. After hot extrusion, the scanning electron microscope results presented that GNPs distributed slightly in Al matrix. Aluminum

## Materials

Graphene nanoplatelets (GNPs) were synthesized using a modified Hummer's method. The GNPs were dispersed in a matrix of pure aluminum (Al) using greasepaint metallurgy. The matrix was prepared by melting Al and casting it into a mold. The GNPs were then dispersed in the matrix and the mixture was hot extruded. The microstructure of the matrix and the distribution of GNPs were analyzed using scanning electron microscopy (SEM). The mechanical and physical properties of the matrix and the composites were measured using a universal testing machine and a Raman spectrometer, respectively.

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