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On the graphene nanoplatelets reinforcement of hand lay-up glass fabric/epoxy laminated composites

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Abstract

Bending and tensile performance of hand lay-up produced glass fabric/epoxy laminated composites were investigated after matrix reinforcement with pre-dried graphene nanoplatelets (GNPs) up to 30% wt content. Two different types of E-glass fabric, i.e. twill 2×2 and uni-directional, were used for the tested composite samples. The response of the produced nano-composites is being explained by the settling mode of the GNPs onto the surface of the fiberglass filaments, as it was observed by a scanning electron microscope. Due to the different settling modes while increasing GNPs content, different fracture modes of the filaments were detected.

Keywords: A. Laminates, A. Polymer-matrix composites (PMCs), B. Mechanical properties, D. Electron microscopy.

1 Introduction

Graphene is a perfect 2-D lattice of sp^2 -bonded carbon atoms [1,2] forming a honeycomb arrangement with excellent properties [3]. Graphene nanoplatelets (GNPs) with two-dimensional structure

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