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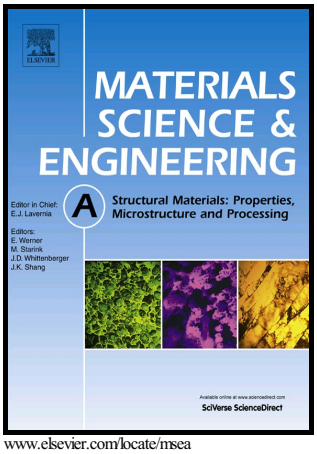

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Electroless Ni-plated graphene for tensile strength enhancement of copper

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ABSTRACT: Graphene nanosheets have shown a significant strengthening effect for metal matrixes. In this paper, we develop a novel eletroless plating method to prepare Ni decorated graphene as an enhancing component in a copper matrix. A good dispersion of Ni nanoparticles on graphene sheets is achieved, which effectively enhances the interfacial compatibility between graphene and copper. The electroless plated graphene-copper composite bulk has a better performance in the mechanical tensile strength compared to pure copper, and also maintains superior ductility, elongation and electrical conductivity.

Keywords: graphene, copper, electroless plating, strength, electrical conductivity

1. Introduction

Since the discovery of graphene in 2004, a window to new technological areas has been opened. Due to its perfect two-dimensional lattice of sp^2-bonded carbon atoms, graphene has demonstrated dazzling properties in many aspects, such as super charge-carrier mobility and mechanical strength [1-3]. One of the emerging applications