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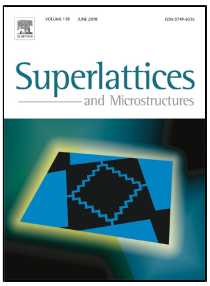

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Fabrication and Characterization of Graphene based Silicon Schottky Solar Cell

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Abstract

Graphene, which is mechanically flexible, electrically conductive, and optically nearly transparent, is a promising contact material in flexible electronics and photovoltaic devices. In the present investigation, methods to obtain graphene film on silicon wafer and fabricate a graphene based Schottky solar cell have been presented. Scrutiny of atomic force microscopy (AFM) and Raman spectroscopy elucidates the formation of thin layer graphene on silicon. Further, I-V (current-voltage) characteristics of Schottky junction (graphene/silicon junction) have also been studied and presented.

1. Introduction

Two-dimensional electronic materials are an emerging research area for the past decade. The importance of high quality 2D materials is well known due to their interesting physics and potential applications in the fabrication of electronic devices. Geometrical, exceptional, mechanical and electrical properties of graphene make outstanding example for these class of materials ([1]–[3]). Each carbon atom in graphene exhibits sp^2 hybridization. Due to two-dimensional honeycomb lattice which leads to extraordinary electrical properties with high carrier mobility (approximately 100,000 cm^2/Vs) [4]. Evidence from literatures reveal that the graphene has Young's modulus