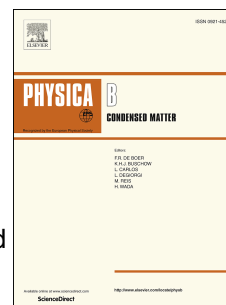


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Boron doped graphene based linear dynamic range photodiode

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Abstract

The boron-doped graphene oxide film was prepared using drop casting/coating technique. The film was coated by hydrothermal method on p-Si substrate and thus Al/p-Si/B-doped GO/Au diode was fabricated. The structural properties of the film was investigated by SEM and EDS techniques. The optoelectronic behaviour of the diode was analyzed under various solar light and frequencies. The diode indicates that the forward current is higher than that of reverse current with a rectification ratio ($RR=I_F/I_R$) of 7.30×10^4 at dark and ± 5 V. The diode electronic parameters of the diode were computed from electrical characteristics. An increase in the photocurrent of the diode with solar light intensity indicates the presence of a photoconduction mechanism. The photoconductive and photovoltaic response of the diode were analyzed using photocurrent measurements. The interface state density (N_{ss}) of the diode was analyzed from conductance technique. The optoelectrical results of the studied device suggest that the diode can be used in optic communications.

Keywords: Diode; Boron; Graphene oxide; Illumination effect; Photoresponse

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1. Introduction

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