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## High performance organic-on-inorganic hybrid photodiodes based on organic semiconductor-graphene oxide blends

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### Abstract

Graphene has attracted considerable research interest due to its unique electrical and optical properties. In present work, we have utilized nanocomposites of poly(3,4-ethylene dioxythiophene):poly(styrene-sulfonate)/graphene oxide (PEDOT:PSS-GO) to fabricate the photodiodes. The current-voltage (I-V) characteristics of the PEDOT:PSS-GO/p-Si junctions having various compositions of GO were studied under dark and illumination conditions. It was observed that the photocurrent of the device increases with increase of GO concentration in the composite. The ideality factors of the diodes having 0.03, 0.05, and 0.1% of GO in the PEDOT:PSS-GO composites were obtained to be 5.43, 5.62, and 2.49, respectively. The diode having 0.1% of GO exhibited the highest photoresponse performance. The obtained results indicate that PEDOT:PSS-GO composites have high potential in photosensor applications. (C) 2014 Elsevier B.V. All rights reserved.

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**Author Keywords:** Graphene oxide; PEDOT:PSS; Spin coating; Photodiodes

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