

Accepted Manuscript

Title: Reduced graphene oxide as a stabilizing layer for optical properties of porous silicon

Authors: Nima Naderi, Sanaz Rasi, Morteza Moradi

PII: S0030-4026(18)30986-0
DOI: <https://doi.org/10.1016/j.ijleo.2018.07.025>
Reference: IJLEO 61181



To appear in:

Received date: 27-2-2018
Revised date: 17-6-2018
Accepted date: 6-7-2018

Please cite this article as: Naderi N, Rasi S, Moradi M, Reduced graphene oxide as a stabilizing layer for optical properties of porous silicon, *Optik* (2018), <https://doi.org/10.1016/j.ijleo.2018.07.025>

This is a PDF file of an unedited manuscript that has been accepted for publication. As a service to our customers we are providing this early version of the manuscript. The manuscript will undergo copyediting, typesetting, and review of the resulting proof before it is published in its final form. Please note that during the production process errors may be discovered which could affect the content, and all legal disclaimers that apply to the journal pertain.

Reduced graphene oxide as a stabilizing layer for optical properties of porous silicon

Nima Naderi*, Sanaz Rasi, Morteza Moradi

Materials and Energy Research Center, Karaj, Iran

*Corresponding author E-mail: n.naderi@merc.ac.ir

Abstract

In this paper, the intrinsic instability of optical properties of porous silicon (PS) was minimized by deposition of graphene on porous structures. A typical PS showed an obvious quenching of its photoluminescence (PL) properties under long-term laser radiation. To resolve this problem, graphene thin film was grown on the porous structure using electrophoretic deposition (EPD) technique. Here, eco-friendly improved Hummer's technique was used for synthesis of charged graphene oxide (GO) sheets. The synthesized high-dispersed GO suspension demonstrated good response in electrical field. For reducing process, in order to fabricate reduced graphene oxide (RGO), thermal annealing of samples was carried out at 100 °C under Ar ambient. The Raman studies confirmed that RGO layers have been deposited on PS substrates successfully. Compared with the PS sample, a reduction by 35% of photoluminescence (PL) intensity was observed for RGO/PS sample. This phenomenon can be explained by light absorption of 2.3% in each graphene layer. The effect of graphene as a stabilizing layer on PS substrate was observed in PL spectrum of RGO/PS sample. The PL quenching was arrested even after prolonged exposure to laser illumination. Therefore, the deposited graphene layer enhances the optical properties of PS by stabilizing the PL intensity.

Download English Version:

<https://daneshyari.com/en/article/7222850>

Download Persian Version:

<https://daneshyari.com/article/7222850>

[Daneshyari.com](https://daneshyari.com)