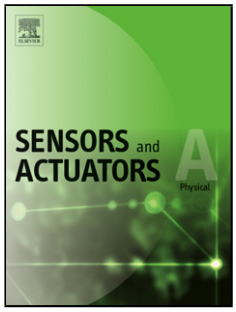

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PII: S0924-4247(18)30028-1
DOI: https://doi.org/10.1016/j.sna.2018.09.030
Reference: SNA 11005

To appear in: *Sensors and Actuators A*

Received date: 13-1-2018
Revised date: 6-9-2018
Accepted date: 10-9-2018

Please cite this article as: Victoriano Huerta N, Luna López JA, Hernández de la Luz JAD, Gómez Barojas E, Benitez Lara A, Monfil Leyva K, Domínguez Jimenez MA, Optical, morphological and electrical analysis of heterostructures PSi/c-Si and SiO_2/MWCNTs/PSi/c-Si, *Sensors and amp; Actuators: A. Physical* (2018), https://doi.org/10.1016/j.sna.2018.09.030

Optical, morphological and electrical analysis of heterostructures PSi/c-Si and SiO_2/MWCNTs/PSi/c-Si.

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Highlights

- Optical and electrical properties of porous silicon whit MWNCT's added.
- Photoluminescence spectra of porous silicon modified due to MWCNT's.
- Transport mechanisms different in SiO_2/MWCNT's/PSi/c-Si heterostructures.

Abstract: Porous silicon (PSi) has been studied extensively due to its photo luminescence (PL) in the visible range at room temperature. PSi layers are useful for various optical and electrical applications among others. The PSi properties can be enhanced using different materials. In the present work, we have decorated PSi single layers with multiple wall carbon nanotubes (MWCNTs). The thickness of PSi layers was determined by the gravimetric analysis, the surface morphology by scanning electron microscopy (SEM), the optical properties were studied by measuring PL and reflectance spectra and the electrical behavior was analyzed from the measured I-V curves for which some theoretical transport mechanisms are used to make a study in depth. These materials and structures have potential applications in chemical sensors.

Keywords: Porous Silicon, MWCNTs, Photoluminescence, SEM, Morphology, Electrical characterization.

Introduction

In 1956 the PSi was discovered by Uhlir, however such fact was unnoticed. It was until the 70s and 80s decades that this material became important being used in chemical sensors applications. In 1990 Leigh Canham discovered the PL of PSi at room temperature [1], this event stumped the scientific community in such a way that a cascade of research works about its PL properties and