



Flexible pressure sensor based on graphene aerogel microstructures functionalized with CdS nanocrystalline thin film

Irina Plesco, Mircea Dragoman, Julian Strobel, Lidia Ghimpu, Fabian Schütt, Adrian Dinescu, Veaceslav Ursaki, Lorenz Kienle, Rainer Adelung, Ion Tiginyanu

<https://doi.org/10.1016/j.spmi.2018.03.064>

Abstract

In this paper, we report on functionalization of graphene aerogel with a CdS thin film deposited by magnetron sputtering and on the development of flexible pressure sensors based on ultra-lightweight CdS-aerogel nanocomposite. Analysis by scanning electron microscopy, transmission electron microscopy and energy dispersive X-ray analysis disclose the uniform deposition of nanocrystalline CdS films with quasi-stoichiometric composition. The piezoresistive response of the aforementioned nanocomposite in the pressure range from 1 to 5 atm is found to be more than one order of magnitude higher than that inherent to suspended graphene membranes, leading to an average sensitivity as high as $3.2 \times 10^{-4} \text{ kPa}^{-1}$.