

## **ZnO-MWCNTs hybrid layer for UV light detection**

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Zinc oxide (ZnO) nanoparticles decorated multi-walled carbon nanotubes (CNTs) were prepared by a simple liquid phase process and then deposited as nanocomposite layer between two electrodes. Optical, structural and electrical properties at different ZnO:CNTs weight ratios were investigated. The combination between CNTs and metal oxide provides the electrical transduction element and the sensitive material, respectively. In particular, the UV detection properties of the nanocomposites were studied by recording the resistance changes of the devices under UV irradiation, at very low operation voltage. As the device is exposed to the UV light, a sharp resistance increase takes place and then a drop is observed as the irradiation is stopped. The detection mechanisms are explained by adsorption and desorption phenomena taking place on the ZnO surface and charge transfer, under UV irradiation. The hybrid material shows good sensitivity and fast response to UV irradiation, and, in combination with its intrinsic electrical transduction property, thanks to carbon nanotubes, reveals itself to be very promising for UV detectors applications. Devices based on such hybrid material allow to overcome some energy consumption issues, due to low operating temperature and voltage. Their production methodology and operation conditions are also compatible with low cost plastic substrates.