Research of the Influence of Climate Change Teaching Plan on the Fourth－grade and Sixth－grade Students' Knowledge, ...

巫建賢、李清華

E-mail: 386796@mail.dyu.edu.tw

ABSTRACT

A novel gas sensor was fulfilled by utilizing the vertically aligned carbon nanotubes (CNTs). CNTs were synthesized by thermal chemical vapor deposition (CVD) at 700oC under C2H2 atmosphere and fabrication gas sensor device. It was found that the average length and average diameter of the CNTs were about ~4.52 μm and ~45nm, respectively. We also coated Auand Ag nanoparticles around 5nm onto nanotube surfaces and fabricated of CNTs for carbon acetone, ethanol, isopropyl alcohol, NH3 and CO2 vapor sensor, respectively. Under 800 ppm vapor concentration, it was found that we could enhance the device sensitivities at room temperature from without nanoparticles 1.89%, 1.69 %, 1.48%, 2.23% and 1.53%, with Au nanoparticles increased to 3.39%, 3.28%, 3.15%, 2.74% and 2.98% by Au adsorption, respectively, with Ag nanoparticles increased to 3.87%, 3.94%, 5.31%, 4.75% and 3.43% by Ag adsorption, respectively. We also coated Auand Ag nanoparticles around 5nm onto nanotube surfaces and fabricated of CNTs for field emission. The turn-on field and current density of the CNTs clearly indicate that the field emission of the coated- nanoparticles was enhanced considerably. In this study, the decoration of nanoparticles effectively decreased effective work function (Φeff) and turn-on field (Eto).

Keywords : carbon nanotubes、gas sensor、nanoparticles、field emission、work function、turn-on field

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