

Doped ZnO based nanostructures for gas sensing applications.

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Recently 3-dimensional nanostructured ZnO based sensors have attracted much attention due to high sensitivity to various gases. For improving electrical characteristics of ZnO semiconductor various dopants can be introduced. Doping method plays crucial role in sensing performance of metal oxide based gas sensors. ZnO tetrapods were doped using three different methods: sputtering diffusion, electroplating, and ink diffusion. Conductivity during interaction with reducing gases was compared. Microstructure was examined using Field Emission Scanning Electron Microscope (FESEM), crystallinity was measured by X-ray Diffraction (XRD), optical properties were obtained by UV-visible spectrophotometer (UV-vis), ionic state of dopants was analyzed by X-ray Photoelectron Spectroscopy. Advantages and disadvantages of each doping method were summarized along with associated sensing mechanism. Results were discussed.

Keywords: ZnO, tetrapods, doping, sensors.

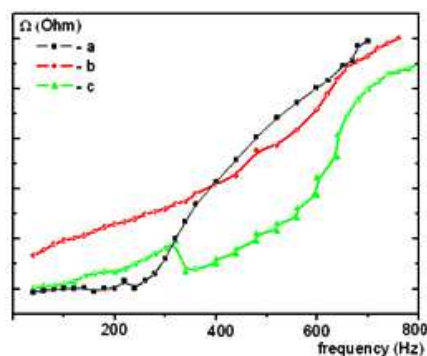


Fig.1 Impedance characteristics of gas sensibility of ZnO nanostructures synthesized by microwave assisted technique.