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The effect of activated carbon on the CO sensing performance of NiO

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Abstract content (Max 300 words) **Formatting & Special chars**

In recent years there has been exponential growth in research activities dealing with nanoparticles for chemi-resistive gas sensing applications. This is because of the high demand for simple, responsive and stable electronic sensors suitable for environmental monitoring in industries, air pollution control, safety at mining sites and firefighting. Different materials including metal/metal oxide nanoparticles, inorganic semiconductors and carbon nanoparticles have all been explored as potential materials for chemi-resistive gas sensing applications. In this work, spherical NiO/activated carbon (AC) composite with flowerlike structures as revealed by field emission scanning electron microscope (FESEM) were successfully synthesized for their application as carbon monoxide (CO) gas sensor via a hydrothermal reflux process. X-ray diffraction (XRD) analysis was used to investigate the crystallinity of the samples while gas sorption analysis was used to probe the surface area of the both the pristine and composite. The materials were subjected to continuous cycles of different CO concentrations and purge with air after each cycles, followed by variations in a normalized resistance study. The results obtained from the gas sensing analysis disclose that the incorporation of AC into flowerlike NiO spheres increased the conductivity and surface area of NiO/AC composite and subsequently enhancing the CO sensing performance of NiO/AC based sensors. These results suggest that the NiO/AC composite could be an excellent electrode material for CO gas sensors.

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Yes

Level for award (Hons, MSc, PhD, N/A)?

PhD

Main supervisor (name and email) and his / her institution

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