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Metal Oxide N-doped CNTs decorated Gas sensors

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Abstract content
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Carbon nanotube (CNTs) continues to exhibit great potential in their applications as chemical sensors due to their unique chemical and physical properties [1-3]. These hexagonal networks of carbon atoms have been used principally due to their large surface area and their ability to fine tune the electrical properties to increase surface reactivity to reagents such as CH4, CO, H2. In this work N-doped MWCNTs (CNx) were synthesised using horizontal chemical vapour deposition (CVD) at 850 ⊠C and decorated with metal oxides for sensor applications. The dependence of structural disorder and electrical properties on nitrogen concentration on CNTs is established. Furthermore functionalization of CNx through the side wall decoration with metal oxide (SnO2 and CuO) nanoparticles has been carried out to enhanced surface reactivity. The physo-chemical properties of the decorated CNx have been carried using XRD, Raman, TEM and EDX to establish the coverage and disorder of the nanoparticles onto CNx matrix. As a proof of concept decorated CNx were tested for gas sensing applications through measurements of the change in electrical resistance as a function of analyte composition (0-250ppm) at varying temperatures (300K-700K).

REFERENCES

1. Brahim, S., et al., Carbon nanotube-based ethanol sensors. Nanotechnology, 2009: p. 7.

2. Klein, K.L., et al., Surface characterization and functionalization of carbon nanofibers. Journal of Applied Physics, 2008. 103: p. 26.

3. Wang, Y. and J.T.W. Yeow, A Review of Carbon Nanotubes-Based Gas Sensors. Journal of Sensors, 2009. 2009: p. 24.

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