

Accepted Manuscript

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PII: S0925-8388(16)33073-0

DOI: [10.1016/j.jallcom.2016.09.310](https://doi.org/10.1016/j.jallcom.2016.09.310)

Reference: JALCOM 39144

To appear in: *Journal of Alloys and Compounds*

Received Date: 14 May 2016

Revised Date: 21 September 2016

Accepted Date: 28 September 2016

Please cite this article as: A.A. Khaleed, A. Bello, J.K. Dangbegnon, D.Y. Momodu, M.J. Madito, F.U. Ugbo, A.A. Akande, B.P. Dhonge, F. Barzegar, O. Olaniyan, B.W. Mwakikunga, N. Manyala, Effect of activated carbon on the enhancement of CO sensing performance of NiO, *Journal of Alloys and Compounds* (2016), doi: 10.1016/j.jallcom.2016.09.310.

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Effect of activated carbon on the enhancement of CO sensing performance of NiO

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Abstract

NiO/activated carbon (AC) composites were successfully synthesized via a hydrothermal reflux process as an electrode material for carbon monoxide (CO) gas sensor application. The X-ray diffraction (XRD) analysis was used to investigate the crystallinity of the samples while gas sorption analysis was used to probe the specific surface area of both the pristine NiO and NiO/AC composite. The sensors were subjected to continuous cycles of different CO concentrations and were purged with air after each cycle, followed by variations in a normalized resistance study. The results obtained from the gas sensing analysis disclose that the incorporation of AC into NiO increased the conductivity and surface area of NiO/AC composite and subsequently enhancing the CO sensing performance of NiO/AC based sensor. These results imply that the NiO/AC composite could be an excellent nanomaterial for CO gas sensors.

Keywords: Amorphous carbon, NiO nanostructure, Composites, CO gas sensors

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