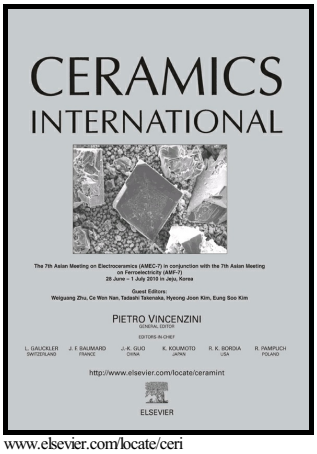

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A. Simo, K. Kaviyarasu, B. Mwakikunga, M. Mokwena, M. Maaza

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A. Simo[1,2*], K. Kaviyarasu[1,2], B. Mwakikunga[3], M. Mokwena[3], M. Maaza[1,2]

[1]UNESCO-UNISA Africa Chair in Nanosciences/Nanotechnology, College of Graduate Studies, University of South Africa, Muckleneuk ridge, P.O. Box 392, Pretoria, South Africa

[2]Nanosciences African Network (NANOAFNET), iThemba LABS-National Research Foundation (NRF), 1 Old Faure road, Somerset West 7129, P. O. Box 722, Somerset West, Western Cape Province, South Africa

[3]DST/Council for Scientific and Industrial Research, National Centre for Nano-Structured Materials, P. O. Box 395, Pretoria 0001, South Africa

[*]Corresponding author: Tel. No. +27 735232713. alinesimo.aline@gmail.com

Abstract

We report the structural properties of Vanadium dioxide (VO_2) nanorods prepared using aqueous solution of vanadium pentoxide, as the starting material before hydrothermal synthesis at 240 °C for 2 days. The XRD data reveal sharp peaks and intense diffraction which demonstrates that the sample is crystallized with strong constructive interference. The conductometric alcohol sensor signal (5-100 ppm) was obtained at room temperature for acetone, methanol, toluene and formaldehyde. The sensor offered promising response characteristics towards alcohols where for 10 ppm of acetone, methanol, toluene and formaldehyde, response magnitude was observed to be 1.5%, 2.7%, 5.5% and 6%, respectively; while for high concentration, the response and recovery magnitude were dominant for methanol with 7.5 % and 8.0 % respectively. The selectivity of the sensor for methanol and formaldehyde are optimum with high and low concentrations. It can be seen that the sensitivity response of VO_2 at room temperature increases to the largest sensitivity for high concentrations of methanol while having higher sensitivity for formaldehyde vapor less than 10 ppm with dominant n-type behavior.

Keywords: Nanostructures; Sensitivity; Vanadium oxide; Volatile Organic Compounds; Nanorods; Sol-gel growth.