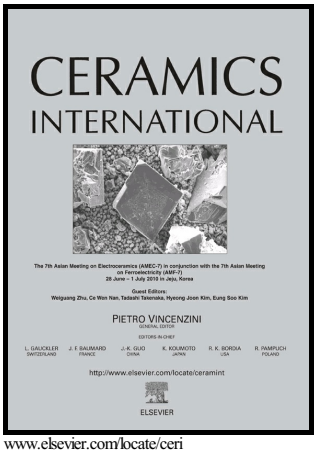

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Y. H. Navale[a], S. T. Navale[b], F. J. Stadler[b], N. S. Ramgir[c], A.K.Debnath[c] S.C.Gadkari[c], S. K. Gupta[c], D. K. Aswal[d], V. B. Patil[a]

[a]Functional Materials Research Laboratory, School of Physical Sciences, Solapur University, Solapur-413255, India

[b]College of Materials Science and Engineering, Shenzhen Key Laboratory of Polymer Science, **and Technology, Guangdong Research Center for Interfacial Engineering of Functional, Materials, Nanshan District Key Lab for Biopolymers and Safety Evaluation, Shenzhen, University, Shenzhen 518060, P.R. China**

[c]Technical Physics Division, Bhaba Atomic Research Centre, Mumbai.

[d]National Physical Laboratory, New Delhi.

(E-mail: drvbpatil@gmail.com)

Abstract

The present paper reports a facile approach to prepare copper oxide (CuO) films directly onto a glass substrate by thermal evaporation method and their chemiresistive properties towards hazardous nitrogen dioxide (NO_2). The influence of annealing temperature on structural, morphological, and gas sensing properties of the CuO films has been thoroughly investigated and reported. Structural and morphological analyses has confirmed the formation of polycrystalline monoclinic CuO with uniformly distributed nanoparticles over the substrate surface. Gas sensing measurements on CuO films reveal the high response, excellent selectivity, fast response-recovery time signatures, good repeatability, and stability towards lower concentration of NO_2 gas @150 ^oC. A maximum response of 48% towards 100 ppm NO_2 has been achieved. Gas sensing results demonstrate an influence of morphology on the NO_2 sensing performance of CuO films. In addition, the interactions between CuO sensor film and NO_2 gas molecules are studied through an impendence spectroscopy analysis.