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Design of CO gas sensor based on chemically deposited ZnO:Ga thin films

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Abstract

Pure and Ga-doped ZnO thin films were successfully deposited on glass substrates using the chemical bath deposition technique. SEM analysis confirmed that undoped ZnO exhibits nanorod structures, whereas the incorporation of Ga in the host lattice resulted in nanospheres, and the increase in wt% of Ga led to the reduction in crystallite size. The optical studies further showed a slight decrease in band gap energy, from 3.87 eV to 3.83 eV, with Ga doping. The electrical behaviour and CO gas-sensing performance of the films were evaluated, including measurements of response and recovery times in the presence of CO gas. Based on these findings, a prototype gas-sensing device has also been proposed.

Keywords: Chemical Bath Deposition, Thin films, Zinc Oxide, gas sensor

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