

## Use of Cu<sub>2</sub>O microcrystalline thin film semiconductors for gas sensing

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### ABSTRACT

Gas sensors based on metal oxides are widely used for the detection of gases and organic vapors. Adsorption of gas molecules on the surface of a metal oxide semiconductor causes a significant change in the electrical conductivity of the material. This study was conducted to investigate the gas sensing properties of n-type microcrystalline cupreous oxide (Cu<sub>2</sub>O) thin films, grown using electro-deposition. The variations in the resistance of thin film were observed for different gases, namely Oxygen, Nitrogen and Liquid Petroleum (LP) gas. The variations in resistance were measured with a higher resolution, for longer time durations and an analysis was conducted to find out how Cu<sub>2</sub>O responded to these environments. Clear variations in the thin films' resistance were observed for O<sub>2</sub> while moderate responses were observed for LP gas. The changes in the resistance for fixed concentrations of O<sub>2</sub> were studied and a change in resistance of 5Ω was observed when O<sub>2</sub> concentration was increased from 0 to 0.311 (O<sub>2</sub>:N<sub>2</sub>) molar ratio in N<sub>2</sub> background.