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Gas Sensing Properties of ZnO Nanowires at Room Temperature
SIRISHA CHAVA, University of Idaho, DAQING ZHANG, California State University, Fresno, CHRIS BERVEN, University of Idaho — We report the electrical properties of a gas sensor constructed from mats of ZnO nanowires grown on sapphire substrate that shows a reversible response which is unique to CO exposure. The sensor is a two terminal design, where the terminals consist of two 25 μm diameter gold wires laid parallel on the nanowire mat. The individual nanowires have an average diameter of 50 nm with lengths of about 10 μm. The nanowire mat is about 20 μm thick and extends over an area of about 1 cm^2. When exposed to Ar, CO_2 or H_2 no significant changes in the current-voltage behavior of the mat are observed. CO exposure results in approximately a three-fold increase in current. The response is reversible after evacuation. Typical currents when exposed to pure CO under room temperature without prior introduction to any other gas are in the range of 40 nA compared to non-exposed 15 nA. Growth technique of nanowires and comparative work will be discussed.

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