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Conducting Metal Oxide Interdigitated Electrodes for Semiconducting Metal Oxide Gas Sensors

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We report the application of conducting metal oxide electrodes for semiconducting metal oxide gas sensors. Pt interdigitated electrodes have been commonly used for metal oxide gas sensor because of the low resistivity, excellent thermal and chemical stability of Pt. However, the high cost of Pt is an obstacle for the wide use of metal oxide gas sensors compared with its counterpart electrochemical gas sensors. Meanwhile, relatively low-cost conducting metal oxides are widely being used for light-emitting diodes, flat panel displays, solar cell and etc. In this work, we have fabricated WO_3 and SnO_2 thin film gas sensors using interdigitated electrodes of conducting metal oxides. Thin film gas sensors based on conducting metal oxides exhibited superior gas sensing properties than those using Pt interdigitated electrodes. The result was attributed to the low contact resistance between the conducting metal oxide and the sensing material. Consequently, we demonstrated the feasibility of conducting metal oxide interdigitated electrodes for novel gas sensors.

Keywords: conducting metal oxide, novel gas sensors, WO_3, SnO_2