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Tin Dioxide Thin-Film-Based Ethanol Sensor Prepared by Spray Pyrolysis

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Thin films of tin dioxide (SnO_2) were grown on glass substrate by chemical spray pyrolysis. The optical band gap of the films was studied and a blue shift was observed from 3.62 to 3.82 eV as the thickness of the film decreased from 1035 to 233 nm. The sensing characteristics of these films were studied at various temperatures and concentrations of ethanol. It was observed that the sensitivity increased with the working temperature. A maximum sensitivity of 98.71% to 500 ppm ethanol was observed at 548 K. A rapid increase in response at lower concentrations and a gradual increase in response at higher concentrations of ethanol were observed. Moreover, the films showed fast response and recovery times at higher working temperatures.

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