



## Pure and Cupricated BaSnO<sub>3</sub> thick film resistor: Synthesis, Characterization and studies on its gas sensing performance

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*Abstract- In this work we report the synthesis, microstructure, electric properties and sensing performance of BaSnO<sub>3</sub> (BS) powder, it was prepared by mechano-chemical method. As prepared powder is calcinated at temperatures 1100 °C, and 1300 °C tested for crystallization. Thick films were prepared using simple screen-printing technology. Structural and electrical analyses were performed and the results have been correlated. The material was tested for various gases such as CO, CO<sub>2</sub>, NH<sub>3</sub>, Cl<sub>2</sub>, H<sub>2</sub>, LPG, ethanol, and H<sub>2</sub>S. The pure BS film shows good response multiple gases at various operating temperature up to 500<sup>0</sup>C as NH<sub>3</sub>, CO<sub>2</sub>, CO, ethanol and, H<sub>2</sub>S for different gas concentrations, when the pure film is surface modified with aqueous solution of CuCl<sub>2</sub> using simple dipping technique for various time intervals (5 min., 10 min., 20 min. and, 30 min.), film improves the selectivity and sensitivity. Maximum response (S=36.2) was found to H<sub>2</sub>S gas at temperature of 250<sup>0</sup>C and S=12.1 for ethanol at 500<sup>0</sup>C for gas concentration of 50 ppm with film dipped for 10 min. time interval. The characterization of the films was done by XRD, SEM and TG-DTA. Crystallite size, texture coefficient, specific surface area, electric properties and gas sensitivity of the films were measured and presented.*

*Index terms: BaSnO<sub>3</sub> (BS); Thick films Resistor; H<sub>2</sub>S gas sensor; Sensitivity; Selectivity.*