

---

# Fabrication of SnO<sub>2</sub> flexible sensor by inkjet printing technology

Omar Kassem<sup>1,2</sup>, Mohammed Saadaoui<sup>2</sup>, Mathilde Rieu<sup>1</sup>, and Jean-Paul Viricelle\*<sup>1</sup>

<sup>1</sup>Ecole Nationale Supérieure des Mines de St Etienne – SPIN-EMSE, UMR CNRS 5307 LGF – France

<sup>2</sup>Ecole Nationale Supérieure des Mines de St Etienne – CMP-EMSE – France

## Abstract

In this work, a flexible tin oxide (SnO<sub>2</sub>) gas sensor was successfully fabricated by inkjet printing technology. This thin film deposition technique requires the formulation of stable suspensions with specific fluidic properties. Sol-gel method was applied to synthesize a stable sol based on tin oxide, then transformed into ink with the appropriate rheological properties to be printed using a drop-on-demand piezoelectric inkjet printer. Thermal analysis by TGA/DSC and microstructural analysis by XRD of synthesized sol show that a crystallized structure of SnO<sub>2</sub> could be obtained at 350°C, which is lower than crystallization temperatures of SnO<sub>2</sub> previously reported in the literature, and entirely consistent with our plastic substrate. The printed thin-film was then sintered at 350°C on a flexible plastic (Upilex-50S).

**Keywords:** Flexible sensor, SnO<sub>2</sub>, Inkjet Printing

---

\*Speaker