

## TiO<sub>2</sub>:WO<sub>3</sub> SENSORS DOPED WITH NIOBIUM OXIDE - HUMIDITY RESPONSE CHARACTERIZATION BY IMPEDANCE SPECTROSCOPY

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**Abstract:** Composite semiconductor sensors have emerged as an alternative for moisture sensors due to the fabrication feasibility of compact and small dimension sensors, good reproducibility, low cost, and chemical and physical stability in aggressive atmosphere. The electronic/ionic charge transfer reactions that takes place at the sensor surface and inside the pores can be used for detection/measure of relative humidity (RH). Thus, final physical/chemical properties highly influences the sensing material conduction mechanisms. Tailor the composite composition and different doping loads are one way for achieving better sensitivity in the full RH range. In this work the sensors were fabricated from powder mixture of TiO<sub>2</sub>:WO<sub>3</sub> with composition of 48.92:51.08 (wt%) and doped with 2, 4 and 6 (wt%) contents of Nb<sub>2</sub>O<sub>5</sub>. The sensors were investigated concerning microstructural characterization and their electrical response was measured in the range 400 Hz - 40 MHz, at the operating temperature of 20 and 30°C and on the relative humidity (RH) range between 10-100%.