

## **WO<sub>3</sub>-Au-Pt nanocrystalline thin films as optical gas sensors.**

### **Abstract**

WO<sub>3</sub> thin films with peculiar morphology were synthesized using sputtering technique, acid boiling and heat treatment. Samples were subsequently impregnated with Au and Pt ions that were reduced to noble metal nanoparticles with high temperature annealing. Structural and morphological characterizations confirm the distinctive lamellar shape of WO<sub>3</sub> crystals and the presence of Au and Pt nanoparticles. Optical gas sensing tests on selected samples show good sensitivity towards H<sub>2</sub>, CO and H<sub>2</sub>S, highlighting a different role played by Au and Pt nanoparticles according to operating temperature. Moreover the sensor response for some samples is wavelength dependent, giving the opportunity to tune the performances of the material by selecting the operative wavelength of analysis.

Keyword:     Wo<sub>3</sub>; Au; Pt; Nanoparticles; Optical sensor.