

## The influence of temperature and visible light activation on the NO<sub>2</sub> response of WO<sub>3</sub> nanofibers prepared by electrospinning

*Thursday, 20 June 2019 17:00 (20 minutes)*

Aim of this work is to compare the electrical responses to 100-400ppb NO<sub>2</sub> gas concentrations of WO<sub>3</sub> electrospun nanofibers both activated by thermal (in the temperature range 25-100°C) and/or visible light at different wavelengths (Red  $\lambda=670$  nm, Green  $\lambda=550$  nm, and Purple-Blue  $\lambda=430$  nm). WO<sub>3</sub> nanofibers were prepared by mixing a W-O sol-gel transparent solution with a polymeric solution made of PVP and DMF, electrospun and subsequently annealed at 450°C. Regarding gas sensing measurements, Purple Blue light resulted the most effective light source as respect to the others. Light illumination at room temperature revealed to improve both base line recovery and response time, whereas temperature enhances relative response, with a maximum at 75°C. Light-radiating room temperature gas detection yields a satisfactory response notwithstanding a slight reduction of sensor gas sensitivity. Light induced electrical response mechanisms is presented and discussed.

### Summary

**Primary author:** Dr PAOLUCCI, Valentina (University of L'Aquila)

**Co-authors:** Dr EMAMJOMEH, Seyed Mahmoud (University of L'Aquila); Prof. ANSELMINI-TAMBURINI, Umberto (University of Pavia); Prof. CANTALINI, Carlo (University of L'Aquila)

**Presenter:** Dr PAOLUCCI, Valentina (University of L'Aquila)

**Session Classification:** Session 4 - Fundamental understanding –Photostimulation