European Network on New Sensing Technologies for Air Pollution Control and Environmental Sustainability - *EuNetAir*

COST Action TD1105

WGs and MC Meeting at Rome, 4-6 December 2012

Action Start date: 01/07/2012 - Action End date: 30/06/2016

Year: 2012-2013 (*Starting Action*)

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Scientific context and objectives in the Action

- **Implementation of semiconductors for gas detection**
- **Characterization of interactions involved between organic/inorganic materials and gases**
- **Development of sensitive and selective sensors for low gaseous pollutant concentrations**
  - ☑ Optimization of the preparation of sensors materials
  - ☑ Identification of sensing mechanisms

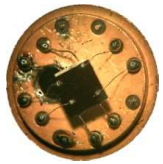
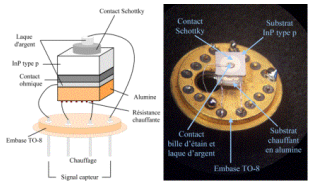
⇨ Functionalized nanostructures for enhanced gas detection at ppb level, stability and selectivity (WG1 objective)

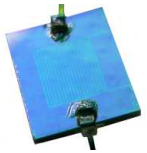
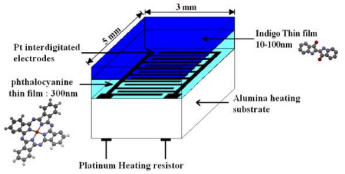
⇨ Relevant sensitive material/transducer association (SIG3 objective)

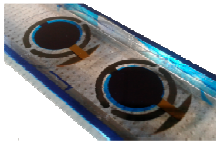
- ***Involved in WG1 and SIG3***

Current research activities of the Partner (1/2)

- Organic/inorganic semiconductor-based gas sensors

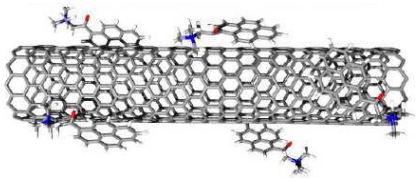
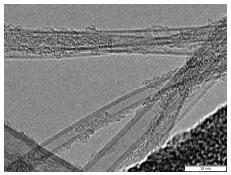
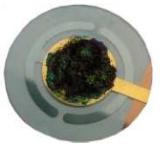
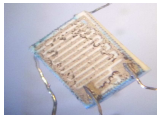



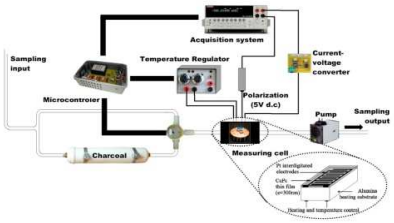


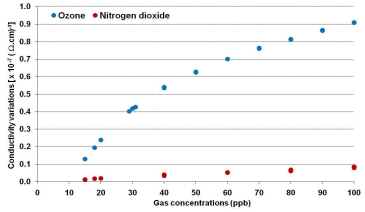
- Functionalized nanocarbons for sensor applications

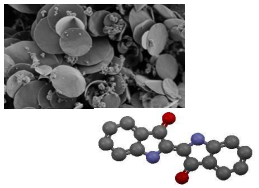
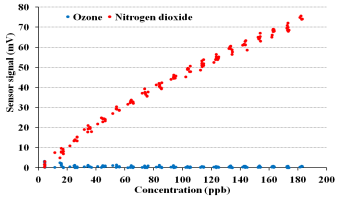

Adding CNTs
+ sonication





IDE's coated with CNTs/MCs

- Chemical filters and working protocols for selective detection





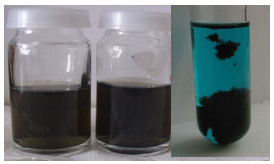
☑ Gas sensors for BTX (National project)

☑ VFAs monitoring by original sensing devices

Research Facilities available for the Partner (2/2)

Materials **Characterizations** **Devices**

Organic or Inorganic SCs

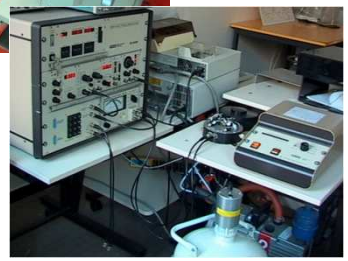


Dispersions preparation functionalisation

Metal deposition

Thin film realization and materials preparation

I(V)



C(V)

Temperature dependent I(V)

Electrical measurements

NOx
O_3

VOCs

BTX

Gas exposures & Calibration

Suggested **Priorities** for future research

→ Priorities

- Try to target low detection range.
- Investigating on the selectivity of the sensing materials by incorporating functional groups.
- Incorporation of the identified functional materials in others matrixes.
- Targeting new materials with high specific surface area.

→ Innovation

- Enhancement of the sensing properties by introducing functional receptive groups.
- Sensor responses monitored by coupling different transduction modes in the same device (resistive sensor and QCM for example).