



COST

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

COST Action TD1105 – Priorities of WG1

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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WG1: Sensor Materials and Nanotechnology (Vice-Chair)

University of Oulu / Finland

Suggested **Priorities** for future research to Action WGs/SIGs General Assembly

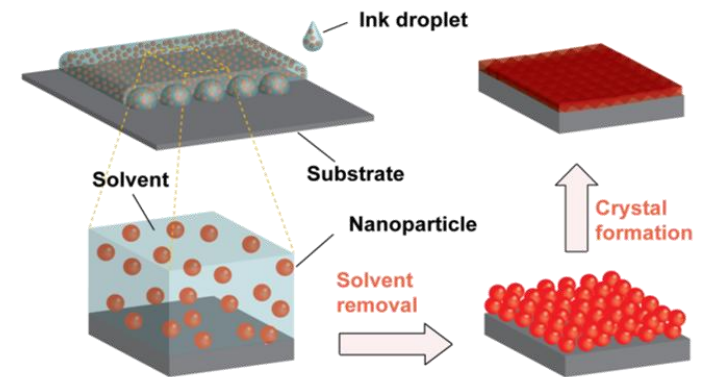
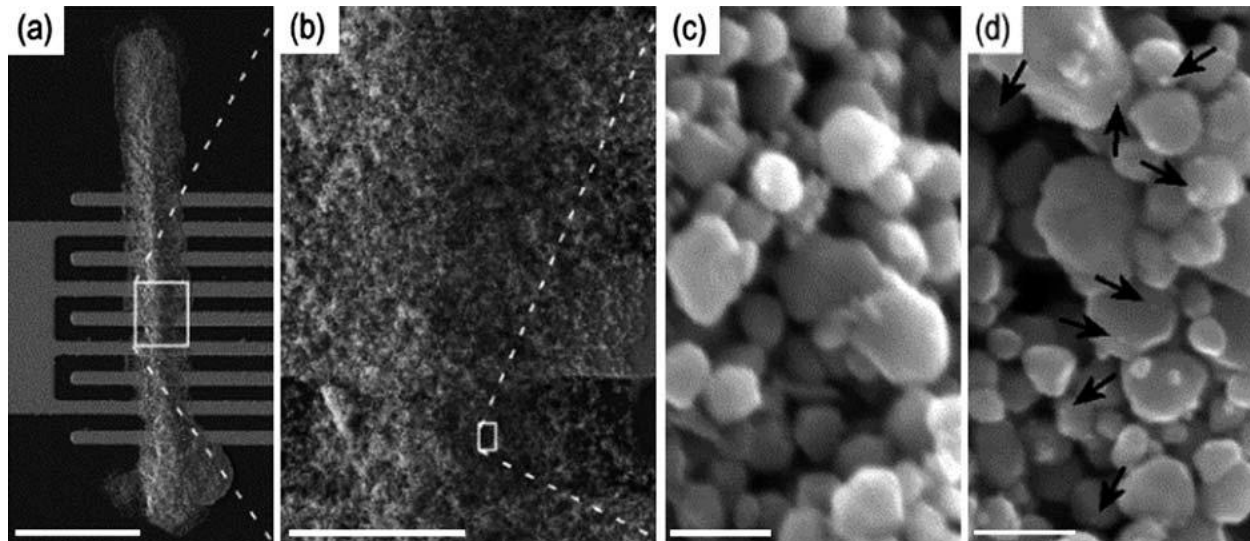
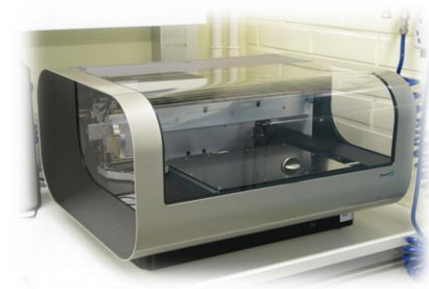
• **Research directions as WGs PRIORITIES for Action TD1105:**

- MO thin films, nanoparticles, nanowires, nanotubes, nanoneedles, nanoporous forms of materials like ZnO, SnO₂, WO₃, TiO₂, InO_x, NiO, and magnetic materials Fe₃O₄, BaSrTiO₃, etc...
 - Doping of the materials to improve sensitivity and selectivity
 - Nanostructuring to increase specific surface area
 - Heterojunction effects of materials
 - Phenomena at the surface
- CNMAT – Carbon Nano Materials and their functionalization, i.e. CNT, graphene
 - Functionalization of CNMAT by metal and MO_x nanoparticles, chemical functionalization
 - Doping of graphene layers, integration of graphene on SiC devices

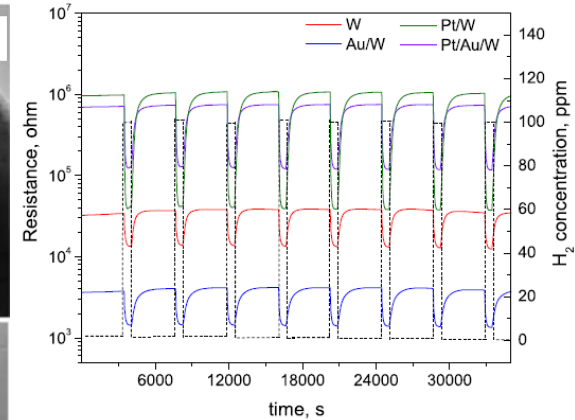
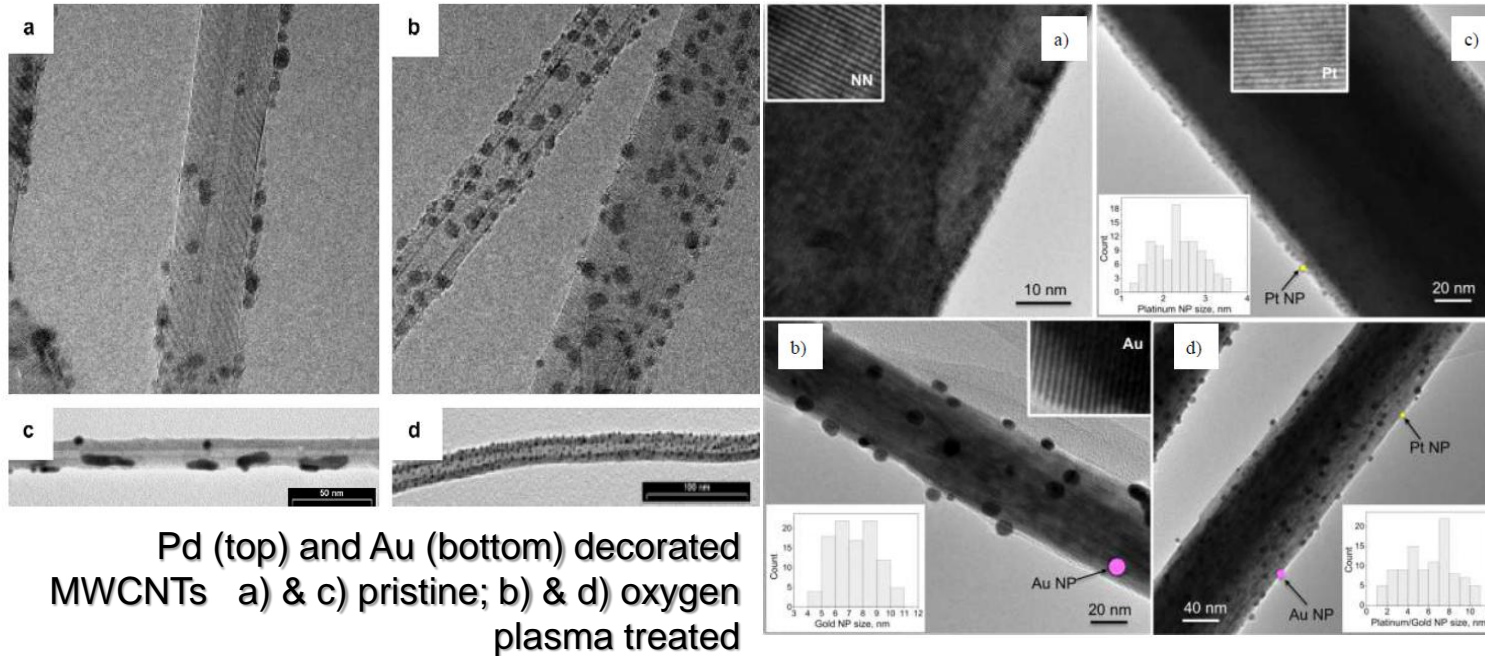
Current research activities of the Partner (1/2)

- Current research topics at the partner organization:
Inkjet-printing and low-temperature processing of decorated WO_3 nanoparticles on various substrates for selective gas sensing:

- Fabrication of Ag, Pd, Pt nanoclusters on surfaces of WO_3 nanoparticles using chemical methods!
(J.Mater.Chem. 22 (2012) 17878)



Current research activities, E. Llobet et al.



ACS Nano, 5 (2011) 45920

Adv. Func. Mat. (2012)
DOI:10.1002/adfm.20120187

- Plasma treatment and metal decoration of CNTs and graphene and integration in silicon or flexible u-hotplates
- Growth, integration, characterization and modeling of low-dimensional MOXs
- Selective detection of benzene traces in air



Suggested **Priorities** for future research to Action WGs/SIGs General Assembly

- **Research directions as WGs PRIORITIES for Action TD1105:**
 - Other materials; biomaterials, enzymes, antibodies, etc...
 - Molecular, organic/inorganic materials
 - Heterostructures of semiconductors and polymers, Schottky junctions
 - Processing of low cost sensors on flexible substrates
 - Printing techniques; inkjet printing, spincoating,...
 - Template assisted growth of nanostructures
 - Chemical modification of materials for tuning properties for selectivity and specific applications
 - Combination of different approaches and defining the the state art of technologies available, for example, to realize smart sensor structures.