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

COST Action TD1105

WGs and MC Meeting at ISTANBUL, 3-5 December 2014

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

Year 3: 1 July 2014 - 30 June 2015 (*Ongoing Action*)

Research and Innovation Needs of WG1: Sensor Materials and Nanotechnology

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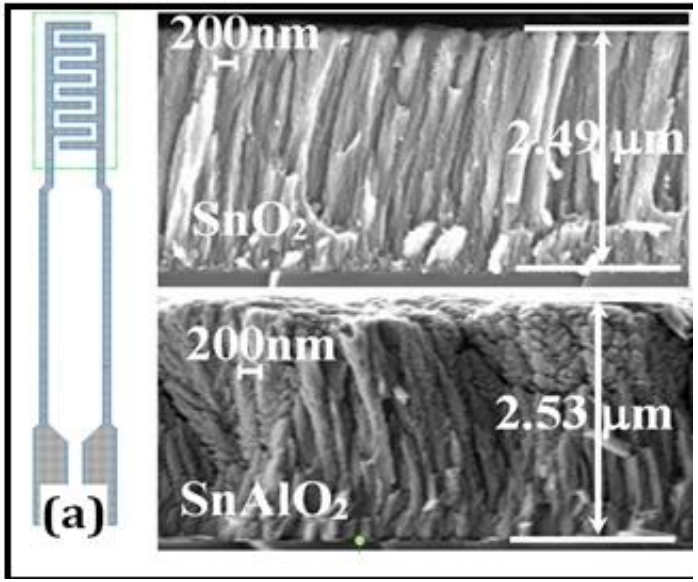
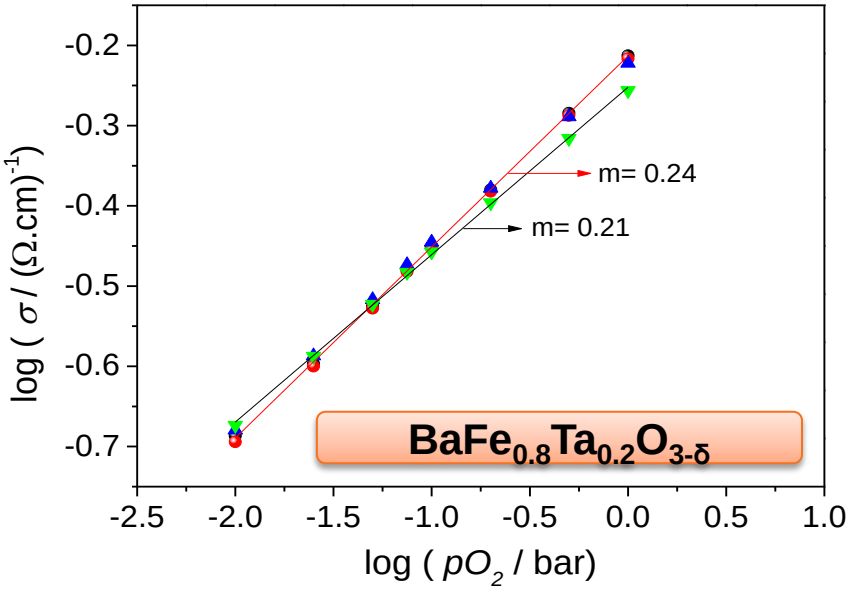
Suggested R&I Needs for future research to Action WGs/SIGs General Assembly

- **Research directions as WGs R&I NEEDS for Action TD1105:**

1. Structural tailoring of semiconductor oxides by doping and compositional modifications in order to improve *stability*, *sensitivity* and *selectivity* (3S)!





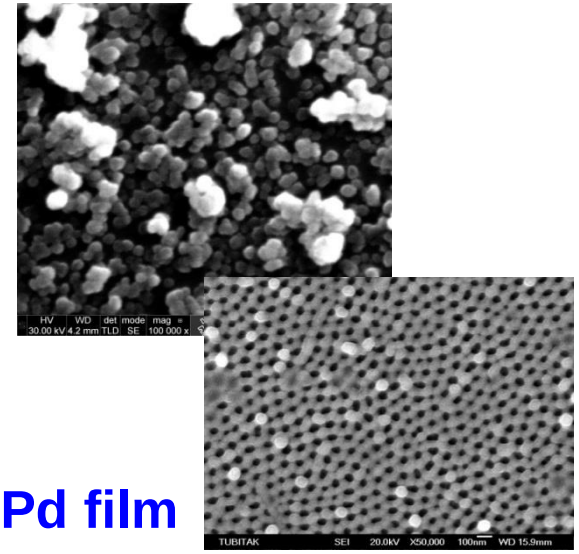
R. Feynman in 1950's: "*There is plenty of room down there*"

Suggested **R&I Needs** for future research to Action WGs/SIGs General Assembly

- **Research directions as WGs R&I NEEDS for Action TD1105:**

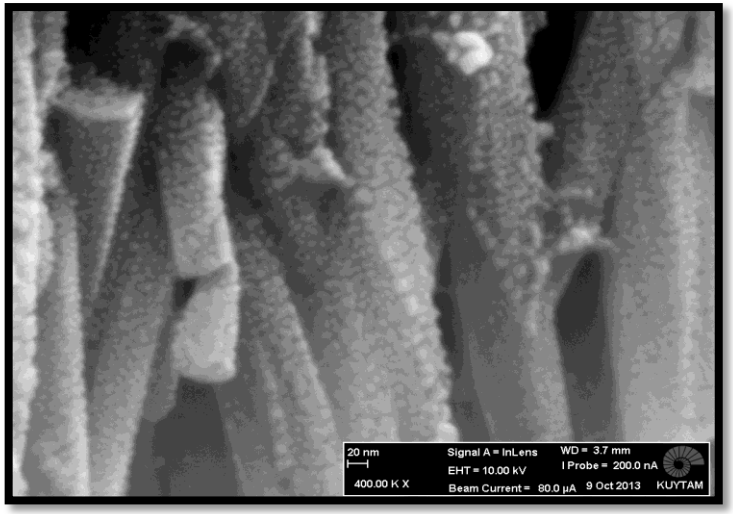
  2. Nanostructured matter. Fabrication of MOS nanoparticles, functionalization of MOS's and CN's by decoration with metal nanoparticles, metal NP's as sensors Pd, Pd, etc.

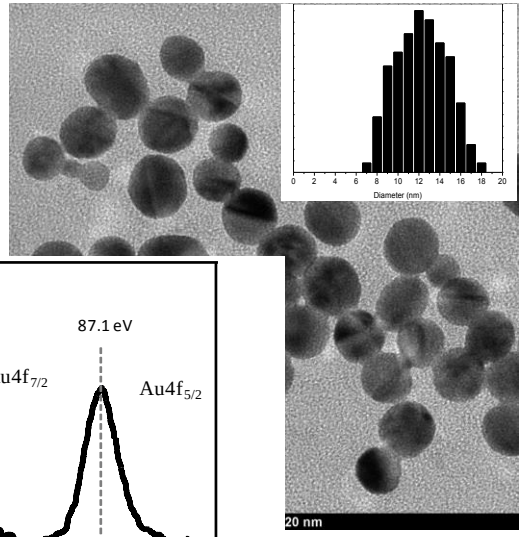
PLD of WO_3 NP's, $\phi \approx 50$ nm:



Pd film

SEM image of Cr functinalized ZnO nanorods

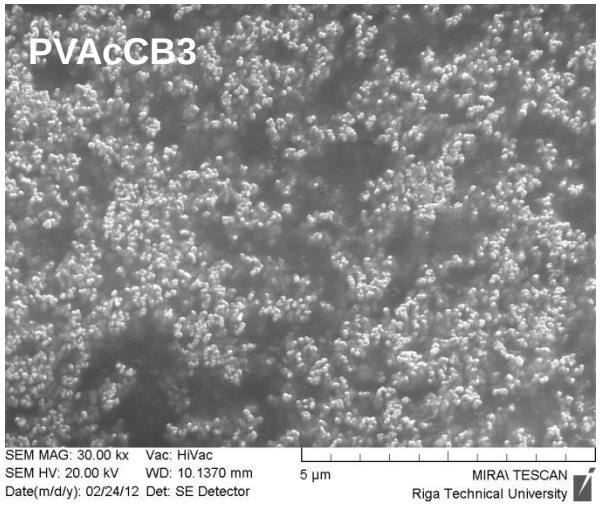




Suggested R&I Needs for future research to Action WGs/SIGs General Assembly

- **Research directions as WGs R&I NEEDS for Action TD1105:**

  3. New materials, structures, and sensing mechanism. Easy of fabrication of chemiresistive polymers, promising for low-cost application, and massproduction.

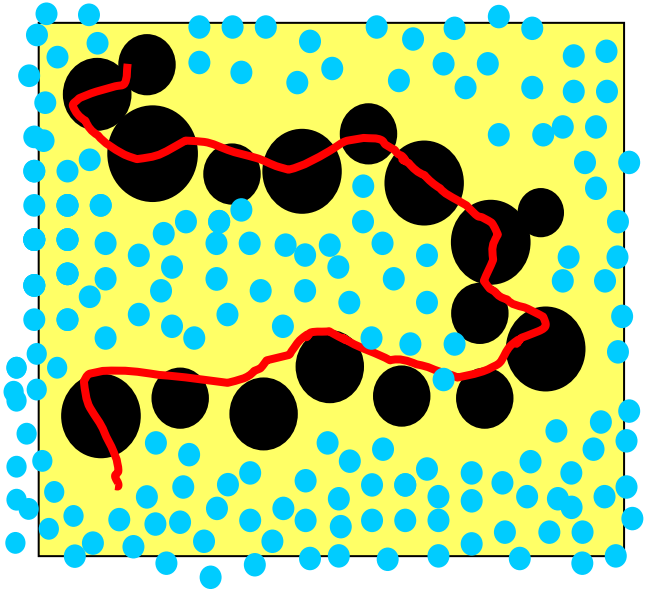


Polyvinylacetate (PVAc)

Polyethylene glycol (PEG)

Ethylene-vinylacetate (EVA)

Polyisopene (Pi)



Suggested R&I Needs for future research to Action WGs/SIGs General Assembly

- Explore further the nanostructures and nanoparticles of MOS's, CN's, and metals. *New phenomena*!
- Detailed structural modification and characterization of MOS's in order to *optimize senstivity and stability*.
- *Utilization of mixed-phase structures, composites*, and utilization, for example, p-n junctions in gas sensing process.
- Converging towards standard methods for *integration into low-cost mass-production processes*.