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

COST Action TD1105

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UNIVERSITY of OULU
OULUN YLIOPISTO

Prof. Jyrki Lappalainen,

SIG3: Guidelines for Best Coupling Air Pollutants and Transducers

University of Oulu / Finland

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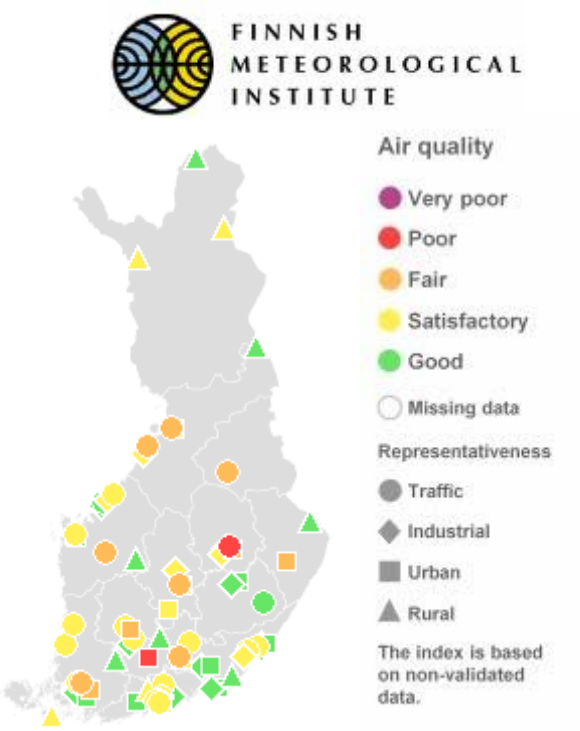
• SIG3 - Examples of applications of solid state sensors for urban air quality monitoring in Finland

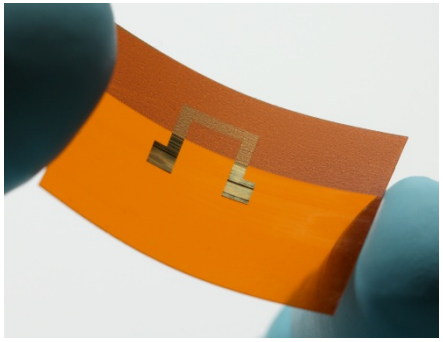
- Generally speaking very high air quality; only local and temporal problems due to emissions of trafic.
- Largest air pollution emissions from household fire places.
- Need for solid state combustion-controll sensors and CO sensors.
- **New problem; humidity generated mould and spore problems impairing indoor air quality.**
- **New problem; increase of VOC's in indoor air due to high thermal insulation.**

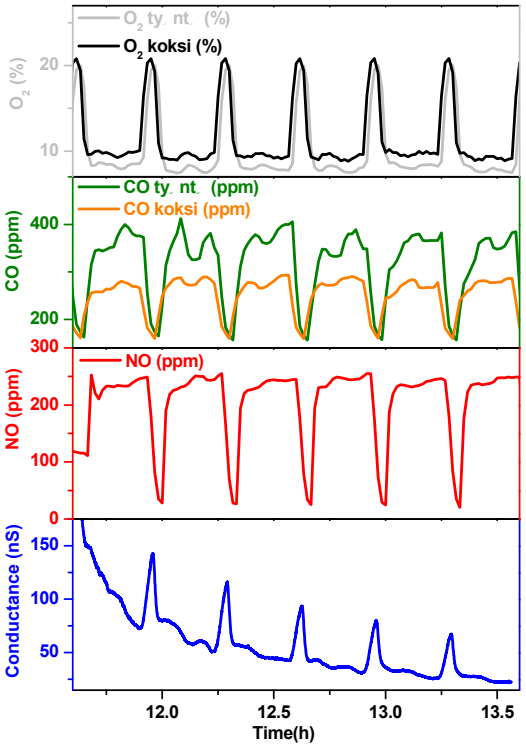


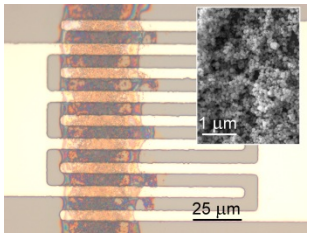
• SIG3 - Examples of applications of solid state sensors for urban air quality monitoring in Finland

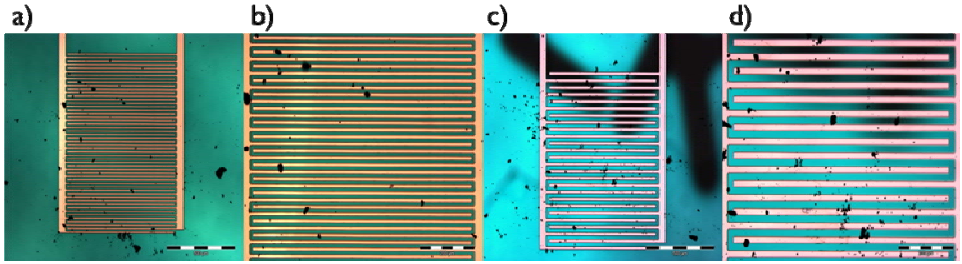
- Strict pollution limits to industry for both gas and particle emissions
- Optical and spectroscopy based measurement techniques for official emission controll
- Need for low-cost solid-state gas sensors for process and personal dose controll
- Need for low-cost solid-state particle sensors for personal dose controll

• SIG3 - Examples of applications of solid state sensors for urban air quality monitoring in Finland









Captured airborne particles from a steel plant

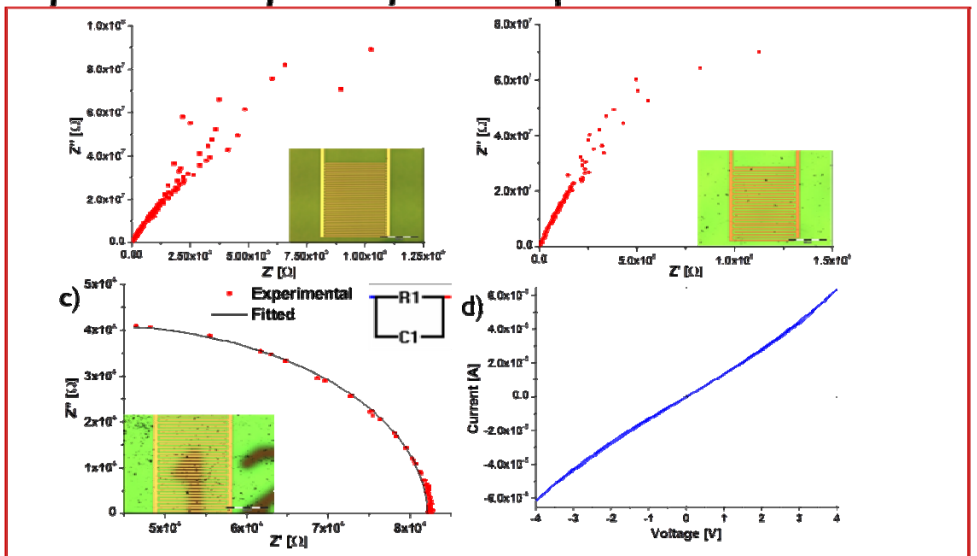


Figure 5. Impedance spectra of airborne particles trapped from the steel plant to the sensor: a) sensor placed in an office building in the plant, b) sensor placed in location of "medium" concentration of airborne particles, c) sensor placed in a location of "high" concentration of particles. In plots a) and b) the spectra are basically the same as in an empty electrode resulting from the low concentration of particles on top of the sensor. The sensor in c) had enough particles to make the electrode dc conducitive, thus making the measurement of I-V curve possible in d). The impedance spectrum could be fitted to equivalent circuit of one R-C loop.