

**European Network on New Sensing Technologies for Air Pollution
Control and Environmental Sustainability - *EuNetAir*
COST Action TD1105**

INTERNATIONAL WG1-WG4 MEETING on

New Sensing Technologies and Methods for Air-Pollution Monitoring

European Environment Agency - EEA

Copenhagen, Denmark, 3 - 4 October 2013

POSTER SESSION

Action Start date: 01/07/2012 - Action End date: 30/06/2016 - Year 2: 2013-2014

**Detection of low concentrations
of VOCs with SiC-FETs**

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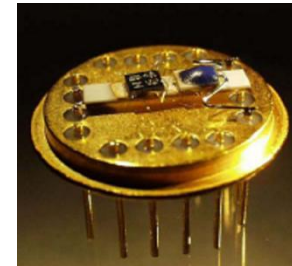
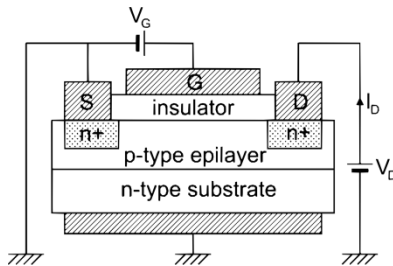
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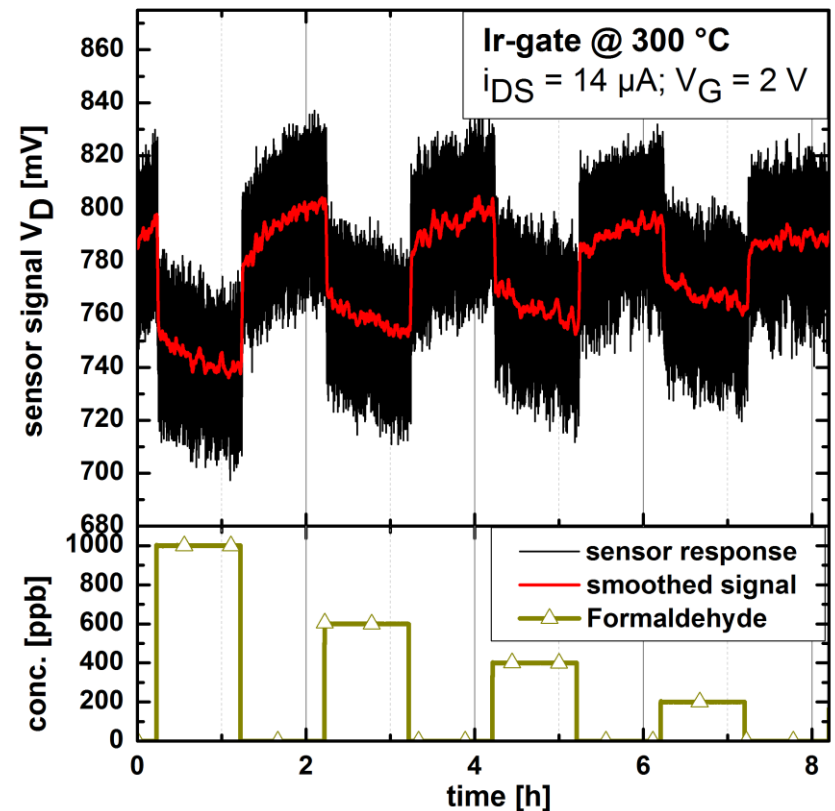
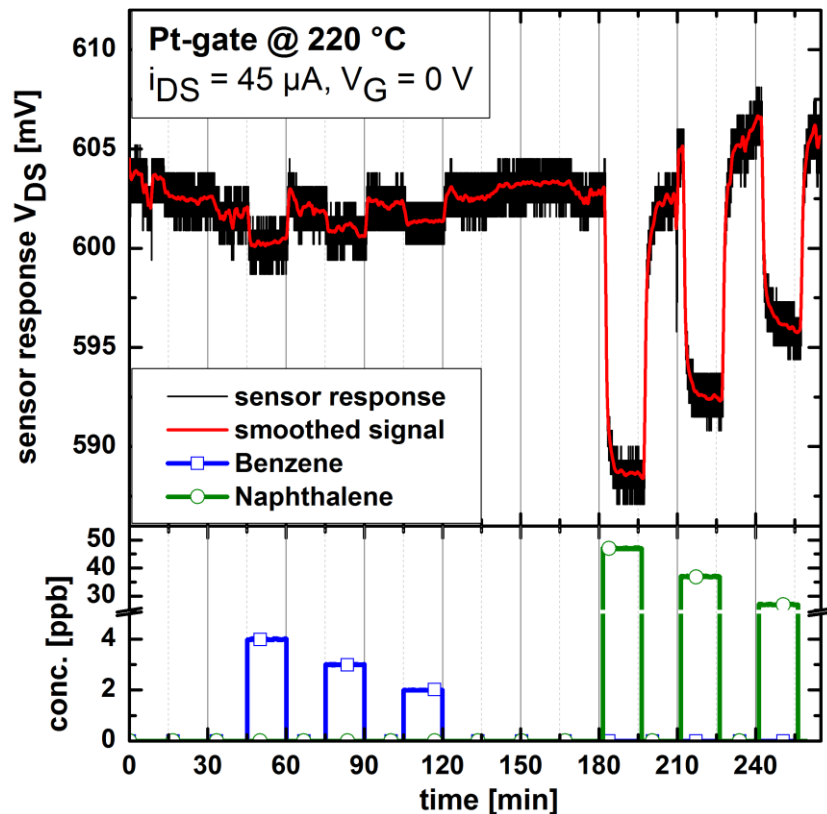
Scientific Context and Objectives

- **Indoor Air Quality** and **sick building syndrome**
- **Volatile Organic Compounds (VOCs)**
 - are main pollutants
 - pose serious health risks, could increase the risk for cancer
 - relevant at ultra-low concentrations (down to sub-ppb)
- French law set a threshold limit of 0.6 ppb for benzene by 2016
- **Gas sensitive SiC-Field Effect Transistors (SiC-FET)** with platinum and iridium gates have been studied for VOC detection



RESULTS

- Gas sensitive SiC-FETs with Pt and Ir gate
- Detection of Benzene and Naphthalene down to a few ppb
- High sensitivity to Formaldehyde w. Ir gate



CONCLUSIONS and Future Activities

- Both Ir- and Pt-gate SiC-FETs are suitable for VOC detection in the relevant concentration range
- Detection limit of 1 ppb for benzene and naphthalene
- Formaldehyde can be detected below 100 ppb

- Discrimination of different VOCs
- Detection in gas mixtures (e.g. with ethanol)
- Measurements with varying humidity
- Noise reduction of Ir-gate FETs