



Participant Profile

for the
Turkish-German Strategy Workshop 2006
TÜBİTAK Marmara Research Center,
Istanbul- Gebze Turkey
13 – 15 December 2006



International Bureau (IB)
of the Federal Ministry of
Education and Research
(BMBF)

1. Contact details and personal information

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¹ **Role/function** e.g. working group leader, managing director, postdoc, PhD etc.

² **Organisation type** e.g. university, research institution, small and medium enterprise (SME), industry etc.

Working Group:	<input type="checkbox"/> 1 Material Technologies <input type="checkbox"/> 2 Biotechnology, Genomics and Food <input type="checkbox"/> 3 Energy <input checked="" type="checkbox"/> 4 Information and Communication Technologies <input type="checkbox"/> 5 Environmental Protection, Climate Change and Sustainable Development
Areas of activity:	<input checked="" type="checkbox"/> research <input checked="" type="checkbox"/> technology development <input type="checkbox"/> demonstration <input type="checkbox"/> training <input type="checkbox"/> dissemination <input type="checkbox"/> other:
Keywords characterising your area of research:	Please choose the appropriate key words (max. 5) from the following list: http://www.cordis.lu/fp6/keywords Sensors, Analytical Chemistry, Measurement Technology, Security Technology
Expertise, technologies and infrastructures available in your institution:	Research activities / expertise: supervise the physical conception of chemical sensor, measuring semi-conductor and gas sensor properties.. To design sensors with advance response on exposure to low concentration of different environmental pollutants (CO ₂ , NO _x , SO ₂ and volatile organic compounds such as aliphatic and aromatic compounds, chlorinated hydrocarbons, alcohols, ketons, etc.) on the basis of investigation of the influence of molecular structure of compounds and films structural organization in sensor activity To develop better thin film deposition technique and to explore the quality of thin molecular films through characterization of their structural features for the purpose of improvement of film sensor properties. Sensor applications: Detection of VOCs and CWA with QCM / IDT sensor arrays Methods: Sensor preparation techniques: coating of organic and inorganic materials on transducers, electrical characterization (I-V, C-V, I-T, C-T) of the sensitive coating (organic or inorganic) on transducers, Changes of mass (QCM and SAW sensor). Key technologies: Chemical Sensor and Sensor Array Technologies Infrastructures: The existing facilities to conduct the tasks are: 2 computer driven measurement set-up for gas sensing properties equipped with 4 MFC and thermostated bath, Frequency counter Keithley Model: 776, Frequency counter Hewlett Packard Model: 53131A, Electrometer Keithley Model: 617, Impedance Analyser Hewlett Packard 4191A, Leybold Univex 450 Vacuum Deposition



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System, Spin coater, Leybold cryorefrigerator, LCZ Meter Keithley and a Photolithography unit for the development of IDT.

Key publications:

1. "Soluble Phthalocyanines for the Detection of Organic Solvents: Thin Film Structures with Quartz Microbalance and Capacitance Transducers" **Z. Z. Öztürk**, R. Zhou, U. Weimar, V. Ahsen, Ö. Bekaroğlu, W. Göpel, Sensors and Actuators B-26-27 (1995) 208-212
2. "Phthalocyanines as Sensitive Materials for Chemical Sensors", R. Zhou, F. Josse, W. Göpel, **Z. Z. Öztürk**, Ö. Bekaroğlu, Applied Organometallic Chemistry 10 (1996) 557-577
3. "Molecular recognition with metal containing supramolecular compounds: soluble tetradentate dithioglyoximes for the detection of organic solvents in the gas phase" **Z. Z. Öztürk**, R. Zhou, V. Ahsen, Ö. Bekaroğlu, W. Göpel, Sensors and Actuators-B 35-36 (1996) 404-408
4. "Halogen sensing using thin films of crosswise-substituted phthalocyanines", A. Altındal, S. Dabak, **Z. Z. Öztürk**, Ö. Bekaroğlu, Sensors and Actuators B 77 (2001) 389-394
- 5... "MESOMORPHIC PHTHALOCYANINE AS CHEMICALLY SENSITIVE COATINGS FOR CHEMICAL SENSORS" T. BASOVA, C. TAŞALTIN, A.G. GUREK, M. A. EBEOĞLU, **Z.Z. ÖZTÜRK**, V. AHSEN, SENSORS AND ACTUATORS B CHEMICAL-96, (2003) 70-75
6. "Fuzzy Logic and Neural Network Applications on the Gas Sensor Data: Concentration Estimation" Fevzullah Temurtaş, Cihat Taşaltın, Hasan Temurtaş, Nejat Yumuşak and **Zafer Ziya Öztürk**, LECTURE NOTES IN COMPUTER SCIENCE ICCSA 2003, LNCS 2869, pp. 179–186, 2004. Springer-Verlag Berlin Heidelberg 2003
7. "A Study on Neural Networks with Tapped Time Delays: Gas Concentration Estimation", Fevzullah Temurtas, Cihat Tasaltin, Hasan Temurtas, Nejat Yumusak, and **Zafer Ziya Ozturk**, LECTURE NOTES IN COMPUTER SCIENCE ICCSA 2004, LNCS 3046, pp. 398–405, 2004. Springer-Verlag Berlin Heidelberg 2004
8. "Finding the composition of gas mixtures by a phthalocyanine-coated QCM sensor array and an artificial neural network" A. Özmen, F. Tekce, M.A. Ebeoğlu, C. Taşaltın and **Z.Z. Öztürk**, Sensors and Actuators B: Chemical, 115, (2006), 450-454
9. "A neural network implemented microcontroller system for quantitative classification of hazardous organic gases in the ambient air" ,Gulbag, A., Temurtas, F., Tasaltin, C. and **Öztürk, Z.Z.** *Int. J. Environment and Pollution*, Vol. X, No. Y, pp.XXX–XXX. (in pres)



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2. Past and present research collaborations

Are you familiar
with the European
Framework
Programme?

Yes

No

- with Framework Programme 5
 with Framework Programme 6
 with Framework Programme 7

EU-projects you are
involved in:

Past projects

Present projects

**Programme title / contract number / title / acronym / your function
(coordinator / partner / contractor)**

FP5 IST-2001-32494: NOSE II "2nd Network on artificial Olfactory Sensing"
(partner)

FP6 IST 507610: Gospel "General Olfaction and Sensing Projects on a European
Level" (partner)

Other international
collaborations:

Name(s) and
contact details of
potential partners:

**If you would like to suggest the participation of particular partners from the
partner country based on existing contacts or collaboration experience,
you are welcome to indicate their names and contact details below:**

Dr. Udo Weimar
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3. Presentation at the Workshop

I will give a presentation at the workshop (approx. 10 min.) to present my institution, my expertise, and my collaboration interests. The contents of my presentations is summarised below (max. 1 page).



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Motivation

Chemical sensor development is being increasingly driven by the need for real time analysis (testing of pollution emission level detection of very toxic gases in battlefield environments, the trace analysis of explosives etc.).

In the course of daily activity the living and working environment exposes mankind to a variety of toxic gases and vapour. Chemical sensors for explosive detection have attracted increasing attention recently. Although devices based on ion mobility spectrometry, neutron analysis, X-ray backscattering have been developed for explosive detection in airport, there are urgent needs for inexpensive, rapid, sensitive and selective sensors for explosives in humanitarian demining, air transportation, national security and environmental restoration.

From a practical viewpoint, research for new coatings sensitive to detection of organophosphorus compounds and explosives is of great importance, especially for compounds developed for chemical warfare applications.

Nowadays, the use of acoustic devices as chemical sensors is well known, and a growing number of acoustic wave modes (BAW, Surface Acoustic Wave (SAW), Quartz Crystals Microbalance (QCM)) have been used for various application. Surface Acoustic Wave (SAW) devices are attractive for chemical sensor applications because of their small size, low cost, high sensitivity and reliability.

Main Research Areas

Development of chemical and biochemical sensors
Optimization of all components in a complete sensor system including pattern recognition approaches
Systematic characterization of new sensor principles and materials
Synthesis of new materials according to key-lock interaction
Computer-aided design of sensing materials

Transducers

Quartz Crystal Microbalance
Surface Acoustic Wave
Interdigital Transducer
MS diode
MIS diode

I agree with the publication of my data on the Workshop website!

PLEASE FILL IN THIS FORM **UNTIL 22 SEPT. 2006 AND RETURN IT TO:**

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