Editorial

Nanomaterials for Chemical Sensing Technologies

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Current trend in the solid-state sensing technology is the development of nanomaterials and nanostructures with novel functionalities and innovative properties at the nanoscale for high-performance chemical sensing.

The actual state of the nanotechnology has reached mature advancements for nanomaterials processing including functionalizations, nanocomposites, hybridization of materials, nanoparticles, nanowires, nanotubes, nanofibers, nanobelts, nanowalls, and sensing nanodevices to fabricate chemical sensors and sensor arrays with tailored characteristics and tuned properties at the nanoscale level.

In this direction, great efforts in the ongoing research have been doing to fabricate sensors with advanced sensing nanostructures and innovative transducers coupled to proper electronic interfaces and new algorithms of pattern recognition and signal processing.

The key role for high-performance sensors is the engineering of nanomaterials with novel sensing properties for sensing nanodevices and emerging transducers to develop sensor systems at high-sensitivity, high-resolution and high-specificity.

This special issue, NCST, for open-access Journal of Sensors (<http://www.hindawi.com/journals/js/>) has been completely devoted to nanomaterials for sensors and sensing Technologies. This issue has openly called for perspective and original contributions in the field of sensor nanomaterials and sensor technology from outstanding scientists and nanotechnologists. The issue has accepted contributions to cover the full range of sensors from the theory, basic properties, modelling, design, fabrication, processing, integration,

characterization, to the applications of the sensors. The submission of the manuscripts related to the fundamental and applied aspects for the sensory nanomaterials and their novel functionalities and applications included, but not limited to:

- (i) Sensor nanomaterials
- (ii) Nanostructures and thin films for gas sensors
- (iii) Carbon nanotubes chemical sensors
- (iv) Metal oxides nanowires for gas sensors
- (v) Hybrid materials for sensors
- (vi) Nanocomposites and functionalizations for sensing devices
- (vii) Nanostructured materials for gas sensors
- (viii) Mass-sensitive sensors: SAW, TFBAR, QCM
- (ix) Gas sensors and chemiresistors
- (x) Nanosensors
- (xi) Gas sensor arrays
- (xii) Pattern recognition and signal processing
- (xiii) Modelling for chemical sensors
- (xiv) Applications of sensor systems.

The special issue NCST, launched at April 2008, has been officially closed at February 2009, receiving 39 submitted manuscripts, 19 Review Articles and 20 Research

Articles, from worldwide outstanding scientists and top-leading researchers of 17 different Countries according to the geographic-area sharing 52% of the total submitted papers from Europe/Africa, 29% from Asia, and 19% from Americas. The submission full process of the papers was electronically made through the Journal of Sensors Manuscript Tracking System (<http://mts.hindawi.com/>). The four Guest Editors have managed a balanced number of papers according to own expertise by inviting qualified reviewers and by assigning at least 2 referees per paper, excluding some cases. The total number of the reviewers involved in the peer-review process has been about 80.

Review on Special Issue NCST for Journal of Sensors

Gas sensor technologies were first developed in the 1970s and 1980s and have been commercialised by companies that exploit the different sensing principles, namely, optical, electrochemical, resistive and gravimetric. The first two technologies are arguably the most successful but the latter two offer lower cost and higher sensitivity. Recently, new chemical sensing materials and technologies have been invented that exploit the emerging fields of nanoscience and nanotechnology. This special issue contains a valuable collection of articles that relate to nanomaterials, nanotransducers, and signal processing methods. In particular, it covers the emergence of functionalised carbon nanotubes and new metal oxide materials as well as MEMS transducers for the detection of chemicals. The issue is very welcome at a time when many different technologies are being reported, such as carbon nanotubes, but have yet to prove themselves *commercially* when compared to existing electrochemical cells and optical spectrometers. Nevertheless, it is likely that we will see some of these new technologies exploited at a scale unseen before because of the ultralow power and cost that they potentially offer perhaps leading to a new generation of the so-called ubiquitous chemical sensors.

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