

Preface

The first French–Algerian Scientific Congress devoted to “Emerging Materials” took place at Tamanrasset (Algeria) during 22 and 25 February 2003. Accordingly, this Congress was named TAM-MAT I in short for Materials and the venue Tamanrasset.

The Congress was organised by the Ferhat Abbas University of Setif, in view of the widening of the collaboration of the university with other national and international institutions. In particular, the aim was to enhance the 20-year-old fruitful scientific co-operation between Ferhat Abbas University of Setif and the Material Science Departments of Louis Pasteur University in Strasbourg. The conference was also aimed at the development of existing scientific collaborations as well as to generate new contacts between researchers from countries around the Mediterranean.

The opening ceremony gave the first taste of the importance and consideration of this Congress by the presence of the “Walli” of Tamanrasset, the Rector of Setif University, Professor Ismail Debeche and the President of Louis Pasteur University, Professor Bernard Carrière. These last two persons also actively participated in the Congress. The participants had the pleasure of a short visit of the Algerian Minister of Energy during the Congress.

Why such a title “Emerging Materials” was chosen derives from several factors such as the need to generate and tackle new challenges, the demand for cheaper materials with improved selectivity and lifetime satisfying environmental, society and economic considerations. Consequently, this Congress concentrated on the following issues: (i) the catalytic materials, (ii) the insertion of magnetic particles in carbon nanotubes for their electrical and magnetic interests and (iii) the materials with magnetic memory for data storage. The common feature being ‘nanomaterials’; hence the presentations were related to basic academic problems as well as elaborating novel composites and their evaluation as devices. Furthermore, this Congress raised various points on unsolved problems linked to electronic and structural properties as driving forces for functional application from chemical reactivity and catalysis to microelectronics, spin electronic and magnetic memory.

In addition, a Round Table concerning past, present and future Algerian–French co-operation was held during this Congress with a wide range of debates on the science as well as the politics of further collaborations. The discussions by the participants present were enhanced by the contribu-

tions and the presence of the former Rector of Setif University, Professor A. Tacherift, the Cultural Representative of the French Embassy in Alger, Mr. Toussaint, the President of Louis Pasteur University, Professor B. Carrière and the Dean of Setif Faculty of Sciences, Professor Mustapha Maamache.

The 77 participants, of whom 50 are Algerians, who attended the Congress submitted 27 written contributions and 19 of which have been selected by peer reviews for publication in a Special Issue. It is to be noted that the contributions are interdisciplinary and span wide scientific areas from both physics to chemistry. Their wide interests also point to the success of the existing collaborations between French universities and those of Algeria. It also highlights that new developments are promised at the interface between the two principal countries, France and Algeria, with Emerging Materials as the common denominator.

Considering the various aspects underlined above, this Special Issue is devoted to Emerging Materials and is organised as follows:

- The needs of new materials is treated through the two review papers on:
 - Environmental catalysis.
 - Electron-count control on adsorption upon reducible and irreducible clean metal-oxide surfaces.
- The preparations of such materials is discussed in the following papers:
 - Characterisation of lalithe, a new bentonite type Algerian clay for intercalation and catalysts preparation.
 - Electrocatalytic activity and stability of $\text{La}_{1-x}\text{Ca}_x\text{CoO}_3$ Perovskite-type oxides in alkaline medium.
 - Structural and optical properties of CdS nanocrystals embedded in NaCl single crystals.
 - Elaboration and characterisation of the $\text{Sr}_2\text{FeMoO}_6$ double Perovskite.
- The characterisation techniques are developed in the following papers:
 - Optical properties of SiO_2 determined by reflection electron energy loss spectroscopy.
 - Optical and electrical properties of sputtered ZrN compounds.
 - Inelastic neutron scattering and migration energies in FePd.
 - X-ray diffraction and Mössbauer studies of nanocrystalline Fe–Ni alloys prepared by mechanical alloying.

- Magnetic anisotropy and microstructure in sputtered CoPt(1 1 0) films.
- Characterisation of ZnO films prepared by reactive sputtering at different oxygen pressures.
- Real time opto-digital holographic microscopy (RTODHM).
- The electronic properties are discussed in:
 - First principles study of structural, electronic, elastic and optical properties of MgS, MgSe and MgTe.
 - Modelling of high pressure CO dissociation on Pt(1 0 0) and Pt(1 1 1).
 - Atomic and electronic structure dependence of surface chemical reactivity.
 - Effect of oxygen on the Mn–Co ferromagnetic coupling.
 - Supported magnetic Pd nanoclusters on Ag(1 0 0).
- Finally, an example of catalytic reactivity is given:
 - Ethylcyclopentane reactions on alumina supported low loaded platinum copper catalysts.

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to all who gave time, money and enthusiasm in such a way that this Congress was a success and, we believe, the first one in a long series. The second one, named TAM-MAT II, is planned to eventually take place in Jigel (Algeria) as a 1-week school and in Ouargla as the Scientific Congress. In addition, an inaugural meeting will take place in Setif before the school at Jigel. This is proposed for the end of November or the middle of December 2004. This success of the Congress culminated in an official collaboration between Ferhat Abbas University of Setif and Louis Pasteur University of Strasbourg. The bilateral contract for scientific collaboration was endorsed by the Rector of Setif University and the President of Louis Pasteur University on September 11, 2003.

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