



Preface - 4th COST 539 Workshop “Fabrication, Properties & Applications of Electroceramic Nanostructures”

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This issue contains a selection of refereed papers that have been presented at 4th Workshop: *4 WP-ELENA 2008 “Fabrication, Properties & Applications of Electroceramics Nanostructures”*. Workshop was organized as a part of scientific activities in COST 539 Action “*Electroceramics from nanopowders produced by innovative methods - ELENA*”. Workshop took place on 26-28 June 2008 at the Consiglio Nazionale delle Ricerche, Genoa, Italy and was organized with help of Università degli studi di Genoa. All together, 66 scientists from 16 countries attended the Workshop.

In recent period the scientists participating in COST 539 Action put strong effort to increase the knowledge of tailored innovative procedures for the synthesis of electroceramics powders and materials and to improve their quality for specific electronic sector application. COST 539 Action gives strong opportunity for groups focused on nanopowders and nanostructured electroceramic materials prepared by advanced methods and techniques to work together, to exchange the knowledge and experience and to join together and explore matters of common multidisciplinary interest, especially from public and government research and technological sectors, or representative of funding agencies for research and technology. The improvement in this field are of strong importance for European Communities and research of this field touches many issues of economic, environmental, social, organizational, political, networking and funding interest.

The 4th Workshop 4 WP-ELENA 2008 aimed to be the platform for presenting state in COST 539 Action of the new developments in the broad area of fabrications, properties and applications of nanostructured electroceramics produced by innovative methods from nanopowders. The Workshop also aimed to be a forum for strengthening the networking in the research cooperation, particularly in the new Thematic Call of EU Research Programmes.

The Workshop was organised in 2 plenary (Prof. J.F.Scott and Prof. Hesse), 9 invited and 13 oral lectures. Also 29 posters were presented and were exhibited in the

Conference room all through the duration of the workshop. Among the participants, a large number of young researchers joined this COST Workshop and presented high level scientific contributions (oral and posters). Their presence was strongly encouraged by the COST 539 Action group.

The meeting was opened by the Chancellor of Genoa University, the Directors of the host Institutions DICheP and CNR-IENI and by the Chair of the COST 539 Action. The presence of many high qualified scientists in the field of electroceramics, and particularly in that of ferroelectrics, allowed reaching a high scientific level of the Workshop. An extensive overview on the multiferric systems as well as an extended talk on synthesis and microstructure-properties relationships in ferroelectric nanostructures were presented as plenary lectures, followed by numerous interventions of the participants. The invited lectures were well balanced in the fundamental theoretical and experimental approach, dealing either with innovative synthesis methods, such as self-assembly or mechanochemistry, or some theoretical aspects related to the material properties (e.g. magnetoelectric effects induced by intrinsic surface stress, FORC diagrams for FE switching studies; investigations of atomic ordering in nano-electroceramic by XRD; relationship between chemical segregation and self polarization in FE, etc.), The high scientific level of the members of the COST 539 Action as well as that of the non-COST invited persons was evidenced in the discussion followed to the talks and were continued also during the coffee breaks. On this point, it is worth to remark that beside the lectures of the programme; also the discussions among the participants looked very lively and stimulating. Therefore this meeting also fulfilled one of the main COST target, i.e. to create closer bonds among the different European scientific groups. The oral communications dealt with several topics that have also important industrial impact, like the production of lead-free ferroelectrics/piezoelectrics; the study of magnetic

nanopowders for hypertermic medical application; the use of new techniques for sintering (SPS, MW), etc.

Finally the high number of posters gave a significant contribution of the Workshop. They mostly reported the results obtained by the different groups of the ELENA Action in the field of the synthesis and processing of nanostructures and in that of properties and characterization. A few contributions were also presented for films preparation and characterisation.

We would like to thank to all plenary and invited speakers, oral and poster contributors and session chairs who have guaranteed the successful Workshop. We are especially grateful to the colleagues that helped in the organization of the Workshop and during preparation of this Special Issue of Journal. In addition, we would like to thank to all manuscript referees who devoted their time and enthusiasm to improve the quality of the Special Issue.