

## PREFACE

CIMTEC 2006-11<sup>th</sup> INTERNATIONAL CERAMICS CONGRESS & 4<sup>th</sup> FORUM ON NEW MATERIALS was held in Acireale, Sicily, Italy on June 4-9, 2006. This qualitative and comprehensive congressional event, similarly to the previous editions, has been designed to encompass and derive synergism from a broad interdisciplinarity network capable of offering opportunities for identifying and exploring new directions for research and production. The above based on the view that ongoing and future innovations require at an ever increasing extent a complex array of interconnections among scientific research, innovating technology and industrial infrastructure.

CIMTEC 2006 consisted of two major, closely intertwined events: the 11<sup>th</sup> INTERNATIONAL CERAMICS CONGRESS and the 4<sup>th</sup> FORUM ON NEW MATERIALS. The World Academy of Ceramics and the International Ceramic Federation (ICF) acted as principal endorsers for the first one, and the International Union of Materials Research Societies (IUMRS) for the FORUM.

The 11<sup>th</sup> INTERNATIONAL CERAMICS CONGRESS included 13 Sections (61 Sessions) which covered recent progress in all relevant fields of ceramics science and technology, including the emerging area of nanomaterials in which a Special Symposium has been devoted. The 4<sup>th</sup> FORUM ON NEW MATERIALS consisted of five parallel International Conferences ("Mass and Charge Transport in Inorganic Materials"; "Science and Engineering of Novel Superconductors"; "Diamond and New Carbon Materials"; "Materials in Clinical Applications" and "Advanced Inorganic Fibrous Composites for Structural Applications") and of two Special Symposia ("Spin Injection and Transport in Magnetoelectronics" and "Biomedical Applications of Nano Technologies").

A balanced, high quality programme of invited and contributed papers resulted from the over one thousand scientific and technical contributions effectively presented during the five working days to a large international audience coming from fifty-three countries throughout the world.

The 9 volumes which constitute the Official Proceedings of the CIMTEC 2006 contain a wide selection of the papers presented. Where appropriate, the chapters of each volume have been organized in such a way to follow the flowsheet of the sessions of the congress.

The volume dedicated to the INTERNATIONAL CERAMICS CONGRESS hosts Invited and Contributed matter given at the thirteen Technical Sections, i.e.: *Section A* - Fundamentals of Structure, Property, Reaction and Unit Processes of Ceramic Systems, *Section B* - Corrosion and Tribology Behaviour of Ceramics, *Section C* - Ceramic Powders Synthesis and Processing, *Section D* - Sintering Science and Technology, *Section E* - Non Conventional Routes to Ceramics, *Special Session E-11* - Self-propagating High-temperature Synthesis of Ceramics, *Special Session E-12* - Layered and Functionally Graded Materials, *Section F* - Surface Engineering with Ceramics, *Section G* - Ceramic Composites, *Section H* - Ceramic Joining, *Section I* - Structural Ceramics, *Section J* - Ceramics for Electrochemical, Chemical, Energy, Environmental and Refractory Applications, and *Section K* - Electrical, Magnetic and Optical Ceramics.

Matter presented at the International Symposium on nanoceramics has been collected in a separate volume: "*Disclosing Materials at the Nanoscale*".

Invited and contributed papers presented at the FORUM ON NEW MATERIALS have been collected in seven volumes. Volume 1: 3<sup>rd</sup> International Conference "*Mass and Charge Transport in Inorganic Materials*"; Volume 2: 5<sup>th</sup> International Conference "*Science and Engineering of Novel Superconductors*"; Volume 3: 4<sup>th</sup> International Conference "*Diamond and Other New Carbon Materials*"; Volume 4: 7<sup>th</sup> International Conference "*Materials in Clinical Applications*"; Volume 5: 5<sup>th</sup> International Conference "*Advanced Inorganic Fibrous Composites for Structural Applications*"; Volume 6: "*Spin Injection and Transport in Magnetoelectronics*"; Volume 7: "*Biomedical Applications of Nano Technologies*".

It is noteworthy pointing out how the attribution of papers to the various sections of the books may having been subject to some shortcoming and uncertainties deriving essentially from the same material or

compound possibly involving different functions and uses, or papers containing at the same time aspects linked to structure, processing techniques and properties and their relationships. Where possible the general criterium was adopted to account for the predominant function performed in the specific context in all those cases where the material by itself might be able to carry out different functions. Likewise, an attempt was made to determine the most appropriate location for those communications where complex relationships among processing, properties and structure are involved.

It may be supposed that not all may be entirely satisfied with the solutions adopted, being the matter subjective to some extent. Nevertheless it is hoped that, in spite of the above limitations, also deriving from the very large number and variety of the matter dealt with, a satisfactory compromise may have been reached in making these proceedings volumes logically presented and easy to consult.

Most of the papers were written by authors whose mother tongue is not English. Therefore, considerable revision of the original texts was often required. The partial reworking of several papers and sometimes even complete rewriting was necessary to make clear work valid as regards the technical content but difficult to understand because of lack of proficiency in the English language. Even so, in order to allow the scientific and technical community to have access to the proceedings volumes within a reasonable length of time, compromise was necessary in regard to the quality of writing, and papers containing language imperfections were considered acceptable provided that their technical content was adequate and easily understandable.

The Editor, who also acted as the Chairman of CIMTEC 2006, would like to express his sincere appreciation to all the Institutions and Professional Organizations involved in the congress, to the members of the International Advisory Committees, the National Coordinating Committees, the Co-Chairs Prof. Robert Freer (UK) for the INTERNATIONAL CERAMICS CONGRESS and Prof. Robert Nemanich (USA) for the FORUM ON NEW MATERIALS, the Programme Chairs, the Lecturers, the technical staff of Techna Group, and to the many others who directly or indirectly contributed to the organization. Indeed it was mainly through the involvement of the above organizations and individuals, and the active participation of most qualified experts from major academic and government research institutes and industrial R&D centers of many countries that a very valuable scientific programme could be arranged.

It is therefore expected that the Proceedings of CIMTEC 2006-11<sup>th</sup> INTERNATIONAL CERAMICS CONGRESS & 4<sup>th</sup> FORUM ON NEW MATERIALS will be accepted as an original and valuable contribution to the literature in the field.

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