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**and Milit.Inst.of University Education, HNA, Greece**

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**Proceedings of the 1st WSEAS International Conference on**  
**MATERIALS SCIENCE (MATERIALS'08)**

**Bucharest, Romania, November 7-9, 2008**

**ISSN: 1790-2769**  
**ISBN: 978-960-474-024-61**

**Published by WSEAS Press**  
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All papers of the present volume were peer reviewed by two independent reviewers. Acceptance was granted when both reviewers' recommendations were positive.  
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## **Preface**

This book contains the proceedings of the 1st WSEAS International Conference on MATERIALS SCIENCE (MATERIALS'08) which was held in Bucharest, Romania, November 7-9, 2008. This conference aims to disseminate the latest research and applications in Structures, properties and uses of materials, Nanostructured materials, Computational Material Science, Experiments and Simulation, Composite materials and structures and other relevant topics and applications.

The friendliness and openness of the WSEAS conferences, adds to their ability to grow by constantly attracting young researchers. The WSEAS Conferences attract a large number of well-established and leading researchers in various areas of Science and Engineering as you can see from <http://www.wseas.org/reports>. Your feedback encourages the society to go ahead as you can see in <http://www.worldses.org/feedback.htm>

The contents of this Book are also published in the CD-ROM Proceedings of the Conference. Both will be sent to the WSEAS collaborating indices after the conference: [www.worldses.org/indexes](http://www.worldses.org/indexes)

In addition, papers of this book are permanently available to all the scientific community via the WSEAS E-Library.

Expanded and enhanced versions of papers published in this conference proceedings are also going to be considered for possible publication in one of the WSEAS journals that participate in the major International Scientific Indices (Elsevier, Scopus, EI, ACM, Compendex, INSPEC, CSA .... see: [www.worldses.org/indexes](http://www.worldses.org/indexes)) these papers must be of high-quality (break-through work) and a new round of a very strict review will follow. (No additional fee will be required for the publication of the extended version in a journal). WSEAS has also collaboration with several other international publishers and all these excellent papers of this volume could be further improved, could be extended and could be enhanced for possible additional evaluation in one of the editions of these international publishers.

Finally, we cordially thank all the people of WSEAS for their efforts to maintain the high scientific level of conferences, proceedings and journals.

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## Plenary Lecture I

### Advances in Corrosion Protection Technology



**Professor D.K. Yfantis**  
National Technical University (NTUA),  
GREECE

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**Abstract:** Corrosion is an ubiquitous and thermodynamically inevitable degradation phenomenon associated with the interaction of metallic materials with their environment. Because corrosion has a significant economic and safety impact on society it is not surprising that, over the past 25 years the development of corrosion prevention and protection methods has been my research group's target area. Approaches available for controlling corrosion include the application of protective coatings to metal surfaces to act as a barrier or perhaps provide sacrificial protection, the addition of chemical species to the environment to inhibit corrosion, alteration of an alloy composition to enhance its corrosion resistance, and the treatment of the surface to improve its corrosion behaviour. Seeking to develop and improve corrosion protection technology, incorporating environmental concerns, has driven our research at National Technical University of Athens (NTUA).

Our work in these areas will be reviewed and current results presented. In particular, the application of conductive polymers as anti-corrosion coatings will be discussed as well as a new chrome-free passivation method of tinplate. Forecasts of future developments in this area will be presented

**Brief Biography of the speaker:** D.K.Yfantis received his Msc in Chemical Engineering from National Technical University of Athens, Greece (1966).He received his Ph.D (Dr.rer.nat) from Technical University of Munich, Department of Physical Chemistry and Electrochemistry (1986). He is Professor at the School of Chemical Engineering, National Technical University of Athens (NTUA). He is currently visiting professor of University of Athens (Post-graduate program of Dental School) and professor of Post-graduate program, Materials Science and Technology in National Technical University of Athens. He was a visiting professor in the University of Trento (Dipartimento di Ingeneriadei Materiali, Italy,1995).

His research interests cover the area of materials (metallic and biomaterials), especially he focuses on corrosion-protection, development of anticorrosive methods and advanced coatings (based on conductive polymers). He is an author and co-author of more than 160 articles in journals and conference proceedings. He is an author of 5 books in corrosion-protection of materials and biomaterials. He has participated in five European programmes (one of them was awarded, craft award).He has organised 5 conferences in Greece on anticorrosive paints.