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Foreword

This volume contains papers presented at the 3rd International Conference on Electrophoretic Deposition: Fundamentals and Applications, held on October 5 – 9 2008 at the Awaji Yumebutai International Conference Centre, Hyogo, Japan, under the sponsorship of Engineering Conferences International (ECI). This was the third of the successful conference series initiated in 2002 in Banff, Canada, which is the only international meeting series focussing entirely on electrophoretic deposition (EPD) as a processing technique for the fabrication of both traditional and novel materials. The conference attracted over 70 contributed talks and almost 30 posters from 80 participants from 25 countries around the globe. Contributions from representatives of both academia and industry, covering a large number of subject areas related to EPD, were presented reflecting the versatility of the EPD technique as a materials processing technique. The topics ranged from theoretical studies on the fundamental mechanisms of EPD to novel technological developments in EPD for efficient and cost-effective fabrication of a variety of advanced materials. The program was organized in ten technical sessions, a poster session, and a final discussion session.

The papers included in this volume address the successful application of EPD to the synthesis of engineering materials and components, which include free standing ceramic components, ceramic and composite coatings on metallic substrates, fibre-reinforced ceramic composites, nanostructured composites and films, microelectronic substrates, carbon nanotube and bioactive coatings, functional materials, piezoelectric devices and solid oxide fuel cells. The application of EPD for the manufacture of small-scale, near net-shape objects having accurate dimensions is also addressed in some of the papers, including EPD manufacturing of nanoparticle heterostructures and densely packed nanostructured functional films. A few papers explore also the intermediate scale production of ceramics and ceramic coatings by EPD and the integration of EPD in production and manufacturing technologies. EPD techniques employing high dc electric fields, coupled electric and magnetic fields, and pulsed electric fields to produce casts of materials; and approaches to the deposition of carbon nanotube-based films are also included in this volume.

The conference confirmed the impressive potential of the EPD technique for materials processing, highlighting also that further research work is required to expand its applications and to integrate EPD in established manufacturing routes. Thus the main motivation for the organisation of the EPD conference series is to provide a forum for continuing discussion of the basic aspects of EPD and its application in traditional and novel areas of materials processing. Considering that the conference in Japan attracted some of the most recognised experts active in research and development in the field of EPD, the present volume is therefore unique in that it condenses the international state-of-the-art in EPD research. It will constitute a valuable source of information for those whose research interests are in the fields of new materials development, nanomaterials, colloidal processing and electrochemistry, both in industry and academia.

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