

Program

2nd International Conference on Electrophoretic Deposition: Fundamentals and Applications

May 29 – June 2, 2005

**Il Ciocco Hotel and Conference Center
Castelvecchio Pascoli (near Barga), Italy**

Conference Co-chairs:

Dr. A. R. Boccaccini
Department of Materials
Imperial College of Science, Technology and Medicine, London, England

Prof. O. Van der Biest
Department of Metallurgy and Materials Engineering
Katholieke Universiteit Leuven, Belgium

Prof. R. Clasen
Department of Powder Technology
University of Saarland, Saarbrücken, Germany

ECI

Engineering Conferences International
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Brooklyn, NY 11201, USA
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Sunday, May 29, 2005

16:00 – 18:00	Registration
18:30 – 19:00	Reception
19:00 – 20:30	Dinner and Welcoming
20:30 – 21:30	Social Hour

IMPORTANT ANNOUNCEMENTS

- Audiotaping, videotaping and photography of presentations are strictly prohibited.
- Speakers – Please leave at least 5 minutes for questions and discussion.
- Posters should be put on display on Sunday evening and they will remain on display throughout the duration of the Conference.
- Please do not smoke at any conference functions.
- Turn your cellular telephones to vibrate or off during technical sessions.
- Be sure to make any corrections to your name/contact information on the Master Participant List or confirm that the listing is correct. A corrected copy will be sent to all participants after the conference.

Monday, May 30, 2005

07:30 – 08:30 Breakfast

SESSION I: ADVANCED EXPERIMENTAL TECHNIQUES

Session Chair: O. van der Biest

08:30 – 08.50 COLLOIDAL PROBE AFM MEASUREMENTS OF THE ELECTROPHORETIC FORCE
Linda Stappers, Katholieke Universiteit Leuven, Dept MTM, Belgium

08:50 – 09.10 REACTIVE ELECTROPHORETIC DEPOSITION – A MODIFIED TECHNIQUE FOR
THE MANUFACTURING OF DOPED GLASSES AND CERAMICS
Jan Tabellion, Institute for Microsystem Technology, University of Freiburg, Germany

09:10 – 09.30 3D PARTICLE ASSEMBLY IN MICRO-SCALE BY USING ELECTROPHORETIC
MICRO-FABRICATION TECHNIQUE
Jun-ichi Hamagami, Department of Applied Chemistry, Tokyo Metropolitan University,
Japan

09:30 – 09.50 TBD

09:50 – 10:10 EVOLUTION OF THE ELECTRICAL FIELD DROP OVER THE SUSPENSION
DURING EPD
Guy Anné, K.U.Leuven, Dept. of Metallurgy and Materials Engineering, Belgium

10:10 – 10.40 Coffee Break

SESSION I: ADVANCED EXPERIMENTAL TECHNIQUES (continued)

Session chair: Jan Ma

10:40 – 11.00 ADSORPTION PROCESSES AT SOLID SURFACES STUDIED BY
ELECTROKINETIC INVESTIGATIONS
Cornelia Bellmann, R. Plonka, A. Caspari, Leibnitz-Institut für Polymerforschung
Dresden, Germany

11:00– 11.20 DESIGN OF ALUMINA/ALUMINA LAMINATE COMPOSITES WITH CRYSTALLINE-
ORIENTATED LAYERS PRODUCED BY ELECTROPHORETIC DEPOSITION UNDER
A HIGH MAGNETIC FIELD
Tetsuo Uchikoshi, National Institute for Materials Science, Japan

11:20 – 11:40 HIGH PERFORMANCE MEMBRANE-ELECTRODE ASSEMBLY PREPARED BY
USING ELECTROPHORETIC DEPOSITION PROCESS
Kiyoshi Kanamura, Hirokazu Munakata, and Ishida Tomohiko, Tokyo Metropolitan
University

11:40 – 12:30 *Ad hoc* discussions

12:30 Optional excursion to Lucca (with boxed lunch)

12:30 – 14:00 Lunch

14:00 – 17:30 *Ad hoc* sessions and/or free time

16:30 – 17:00 Afternoon Coffee

Monday, May 30, 2005 (Continued)

SESSION II: EPD IN CERAMIC PROCESSING (I)

Session chair: J. B. Talbot

- 17:00 – 17:20 ELECTROPHORETIC DEPOSITION OF NANOCRYSTALLINE SIC CERAMICS
Stefanie Wildhack, Max-Planck Institute for Metals Research and Institute for Nonmetallic Inorganic Materials, University of Stuttgart, Germany
- 17:20 – 17:40 ELECTROPHORETIC DEPOSITION OF ZEOLITE 5A FOR USE IN GAS SEPARATIONS
Wendi S. Sweet, University of California, San Diego, USA
- 17:40 – 18:00 ELECTROPHORETIC DEPOSITION OF SILICON CARBIDE
Sasa Novak, Jozef Stefan Institute, Slovenia
- 18:00 – 18:20 INFLUENCE OF SURFACTANT ADDITION SEQUENCE ON THE SUSPENSION PROPERTIES AND ELECTROPHORETIC DEPOSITION BEHAVIOUR OF ALUMINA AND ZIRCONIA
A.M. Popa, J. Vleugels, J. Vermant, O. Van der Biest, MTM and CIT, KU Leuven, Belgium
- 18:20 – 18:40 ELECTROPHORETIC DEPOSITION OF CERAMIC POWDERS - INFLUENCE OF SUSPENSION AND PROCESSING PARAMETERS
Kirsten Moritz, Freiberg University of Mining and Technology, Institute of Ceramic Materials, Germany
- 18:40 – 19:00 FABRICATION OF MICROSTRUCTURES BY MEANS OF ELECTROPHORETIC DEPOSITION (EPD)
Johannes Zeiner, Saarland University, Department of Powder Technology, Germany
- 19:00 – 19:20 Discussion
- 19:20 – 21:00 Dinner
- 21:00 – 22:00 Social Hour

Tuesday, May 31, 2005

07:30 – 08:30 Breakfast

SESSION III: EPD INTEGRATED MANUFACTURING TECHNOLOGIES

Session chair: Aldo R. Boccaccini

08:30 – 09:00

Keynote Lecture

ELECTROPHORETIC DEPOSITION OF FUNCTIONALLY GRADED MONOMORPH
Jan Ma, Nanyang Technological University, Singapore

09:00 – 09:20

ELECTROPHORETIC DEPOSITION FOR ELECTRONICS MANUFACTURING
Jonathan Van Tassel, Pennsylvania State University, USA

09:20 – 09:40

EPD OF METALLIC SILVER PARTICLES: PROBLEMS AND SOLUTIONS
Martin Zarbov, Cerel (Ceramic Technologies) Ltd., Israel

09:40 – 10:00

PREPARATION OF THIN SOFC-ELECTROLYTE FILMS ON POROUS
LA_{0.75}SR_{0.2}MNO₃ CATHODES BY MEANS OF ELECTROPHORETIC DEPOSITION
Christos Argirusis, TU Clausthal, Germany

10:00 – 10:20

ELECTROPHORETIC DEPOSITION OF SOL-GEL DERIVED V₂O₅
MICROPARTICLES AND APPLICATION TO CATHODE FOR LITHIUM SECONDARY
BATTERIES
Atsunori MATSUDA, Department of Materials Science, Toyohashi University of
Technology, Japan

10:20 – 11:00

Coffee Break

SESSION IV: NANOSTRUCTURED MATERIALS AND FILMS (I)

Session chair: R. Moreno

11:00 – 11:20

FABRICATION OF COLORED SILICA GLASSES BY INCORPORATION OF NANO-
SIZED COLLOIDS VIA REACTIVE ELECTROPHORETIC DEPOSITION (REPD)
Johannes Zeiner, Saarland University, Department of Powder Technology, Germany

11:20 – 11:40

ELECTRONIC PROPERTIES OF WIRES FABRICATED VIA DIELECTROPHORESIS
OF COLLOIDAL GOLD NANOPARTICLES
D.R. Oliver, University of Manitoba, Canada

11:40 – 12:00

CATHODIC ELECTROPHORETIC DEPOSITION OF CERAMIC NANO-PARTICLE
MN-ZN IRON OXIDE
Cody Washburn, Jacob Jorne, and Santosh Kurinec
Rochester Institute of Technology, Rochester, USA

12:00 -12:20

ELECTROPHORETIC DEPOSITION OF NANOCRYSTALLINE BATIO₃ IN ETHANOL
MEDIUM
Aydin Dogan, Anadolu University, Turkey

12:20 – 12:40

MANUFACTURING OF SILICA GLASSES BY AQUEOUS ELECTROPHORETIC
DEPOSITION
Jan Tabellion, Institute for Microsystem Technology, University of Freiburg, Germany

12:40 – 13:00

ELECTROPHORETIC DEPOSITION OF CARBON NANOTUBES ON METALLIC
SURFACES
Aldo R. Boccaccini, Boris Thomas, Sarah Freeman, Milo Shaffer, Imperial College
London, UK

Tuesday, May 31, 2005 (Continued)

13:00 – 14:30 Lunch

Optional excursion to Barga

14:30 – 16:30 *Ad hoc* sessions and/or free time

16:30 – 17:00 Afternoon Coffee

SESSION V: THEORY AND MODELING

Session Chair: R. Clasen

17:00 – 17:30

Keynote lecture

MECHANISMS OF ELECTROPHORETIC DEPOSITION

Jonathan Van Tassel, Pennsylvania State University, USA

17:30 – 17:50

A RESISTIVITY MODEL FOR ELECTROPHORETIC DEPOSITION

Begoña Ferrari, Instituto de Cerámica y Vidrio, CSIC, Madrid, Spain

17:50 – 18:10

INFLUENCE OF ELECTROSTATIC INTERACTIONS IN THE DEPOSIT ON THE ELECTRICAL FIELD STRENGTH DURING ELECTROPHORETIC DEPOSITION

Guy Anné, K.U.Leuven, Dept. of Metallurgy and Materials Engineering, Belgium

18:10 – 18:20

Short Break

SESSION VI: CERAMIC COMPOSITES

Session Chair: R. Clasen

18:20 – 18:40

MECHANISM OF ELECTROPHORETIC DEPOSITION TO INFILTRATE OXIDE FIBRE MATS FOR FABRICATION OF CERAMIC MATRIX COMPOSITES

E.Stoll, Institute of Materials Technology, Technical University Ilmenau, Germany

18:40 – 19:00

ELECTROPHORETIC DEPOSITION OF MULLITE BASED SYSTEMS ON C/C-SIC COMPOSITES

T. Damjanovic, TU Clausthal, Germany

19:00 – 19:20

Discussion

19:20 – 21:30

Dinner

21:30 – 22:30

POSTER SESSION and Social Hour

Wednesday, June 1, 2005

07:30 – 08:30 Breakfast

SESSION VII: EPD IN INDUSTRIAL APPLICATIONS AND COATINGS

Session Chair: J. Vleugels

08:30 – 09:00

Keynote lecture

ENGINEERING TOLERANCES AND PROCESS DEFECTS IN APPLIED EPD
David Brandon, Cerel (Ceramic Technologies) Ltd. and Faculty of Materials Sciences,
Technion - Israel Institute of Technology, Israel

09:00 – 09:20

THE ROLE OF PARTICLE FILTRATION IN INDUSTRIAL SCALE EPD PROCESSES
Peter Hope, LVH Coatings Ltd, UK

09:20 – 09:40

ELECTROPHORESIS IN MEMBRANE SEPARATION PROCESSES: FROM LAB TO
FIELD SCALE EXPERIMENTS
Guido Falk, Saarland University, Department of Powder Technology, Germany

09:40 – 10:00

ELECTROPHORETIC DEPOSITION OF CERAMIC SUB MICRON PARTICLES AT
HIGH VOLTAGES IN ORGANIC DISPERSING MEDIA
G. Vargas, CINVESTAV, Unidad Saltillo, Coahuila, México.

10:00 – 10:30

PANEL DISCUSSION: The role of gravity on EPD (Possible European Space Agency
proposal)
O van der Biest, KU Leuven, Belgium

10:30 – 11:00

Coffee Break

SESSION VIII: NANOSTRUCTURED MATERIALS AND FILMS (II)

Session Chair: D. Brandon

11:00 – 10:20

PREPARATION OF MESOPOROUS SILICATE THICK FILMS BY
ELECTROPHORETIC DEPOSITION AND THEIR ADSORPTION PROPERTIES OF
WATER VAPOR
H. Negishi, National Institute of Advanced Industrial Science and Technology, Japan

11:20 – 11:40

YBCO THICK FILMS ON NI TAPES PRODUCED BY EPD
Laurent Dusoulier, University of Liège, Belgium

11:40 – 12:00

MICROPATTERNING OF PHENYLSILSESQUIOXANE THICK FILMS BY THE
ELECTROPHORETIC SOL-GEL DEPOSITION PROCESS USING ITO SUBSTRATES
WITH A HYDROPHOBIC-HYDROPHILIC PATTERNED SURFACE
Kiyoharu Tadanaga, Graduate School of Engineering, Osaka Prefecture University,
Japan

12:00 – 12:20

STABILIZATION OF NANOPARTICLES SOLS AND SUSPENSIONS FOR EPD
PROCESSING
Luz M. Avilés, Begoña Ferrari, Esthela Ramos, Rodrigo Moreno, Instituto de Cerámica
y Vidrio, CSIC, Madrid, Spain

12:20 – 12:40

Discussions

12:40 - 14:00

Lunch

Wednesday, June 1, 2005 (Continued)

14:00 – 16:30 *Ad hoc* sessions and/or free time

16:30 – 17:00 Afternoon Coffee

SESSION IX: EPD IN CERAMIC PROCESSING (II)

Session chair: J. van Tassel

17:00 – 17:20 THERMOGELATION OF COMPOSITE FILMS PRODUCED BY ELECTROPHORETIC CO-DEPOSITION
Rodrigo Moreno, Instituto de Cerámica y Vidrio. CSIC, Spain

17:20 - 17:40 MICROSTRUCTURED CERAMIC COMPONENTS AND COATINGS VIA ELECTROPHORETIC DEPOSITION
Holger von Both, Wieland Dental + Technik GmbH Co KG, Germany

17:40 – 18:00 EFFECT OF PARTICLE SIZE DISTRIBUTION AND SEDIMENTATION BEHAVIOR ON ELECTROPHORETIC DEPOSITION OF CERAMIC SUSPENSIONS
Sylvia Bonnas, Forschungszentrum Karlsruhe, Germany

18:00 – 18:20 ELECTROPHORETIC DEPOSITION OF YTTRIA-STABILIZED ZIRCONIA FINE POWDER - SOME REMARKABLE FACTORS AFFECTING DEPOSITION BEHAVIOR
Shigeo Hayashi, Faculty of Engineering and Resource Science, Akita University, Japan

18:20 - 18:40 INFLUENCE OF DOPANTS ON THE SUSPENSION PROPERTIES AND REACTIVE ELECTROPHORETIC DEPOSITION
Dirk Jung, Saarland University, Department of Powder Technology, Germany

18:40 – 19:00 Discussion

19:30 – 22:30 Conference Banquet and Social Hour on the Mountain

Thursday, June 2, 2005

07:30 – 08:30 Breakfast

SESSION X: BIOMATERIALS AND BIOACTIVE COATINGS

Session chair: A. Matsuda

08:30 – 08:50 DEVELOPMENT OF METAL-FREE DENTAL CROWNS AND BRIDGES USING ELECTROPHORETIC DEPOSITION OF TZP- AND ZTA-POWDERS
Tassilo Moritz, Fraunhofer Institute for Ceramic Technologies and Sintered Materials, Germany

08:50 – 09:10 NEAR-NET-SHAPING OF FUNCTIONALLY GRADED HIP PROSTHESES BY ELECTROPHORETIC DEPOSITION
Guy Anné, K.U.Leuven, Dept. of Metallurgy and Materials Engineering, Belgium

09:10 – 09:30 THE ELECTROPHORETIC DEPOSITION OF BIOGLASS® PARTICLES ON STAINLESS STEEL AND NITINOL SUBSTRATES
Aldo R. Boccaccini, D. Krause, E. Minay, Imperial College London, UK

09:30 – 10:00 PANEL DISCUSSION: THE TEXTBOOK ON EPD
A. R. Boccaccini, Imperial College London, UK

10:00 – 10:30 Coffee Break

10:30 - 12:00 **Conclusions**
(NEXT EPD CONFERENCE,
INDUSTRIAL INVOLVEMENT, SCIENTIFIC NETWORK ON EPD,
INCREASE PARTICIPATION OF “ELECTROCHEMISTRY COMMUNITY”,
EDUCATIONAL MATTERS, ETC.)

12:00 – 13:30 Lunch and adjournment

14:00 Bus departs for Pisa Airport and train station

POSTER SESSION

HIGH PERFORMANCE MEMBRANE-ELECTRODE ASSEMBLY PREPARED BY USING ELECTROPHORETIC DEPOSITION PROCESS

Kiyoshi Kanamura, Department of Applied Chemistry, Tokyo Metropolitan Univ., Japan

EPD OF A NANOSCALE HA POWDER FOR BIOMEDICAL APPLICATIONS

H. Mayr, Friedrich-Baur-Research Institute for Biomaterials, Germany

EPD OF AL₂O₃ AND CE-ZRO₂ FROM MIXED ALCOHOL / KETONE SUSPENSION SYSTEMS

Ana-Maria Popa, Jef Vleugels, Omer Van Der Biest, MTM, KULeuven, Belgium

SILICA DEPOSITS WITH ADDITION OF CALCIUM ION FROM AQUEOUS SYSTEMS WITH APPLICATION OF ELECTRIC FIELD.

J. F. Pérez-Robles, Centro de Investigación y Estudios Avanzados del I.P.N. (CINVESTAV) Querétaro, Mexico

CONTROLLING CRACKS IN SINGLE COMPONENT LAMINAR COMPOSITES WITH DIFFERENT CRYSTALLINE ORIENTATIONS

Tohru S. Suzuki, National Institute for Materials Science, Japan

THROWING POWER OF ALUMINA BASED SUSPENSIONS DURING ELECTROPHORETIC DEPOSITION
Bram Neirinck, K.U.Leuven, Dept. of Metallurgy and Materials Engineering, Belgium

WATER VERSUS ACETONE ELECTROPHORETIC DEPOSITION OF HYDROXYAPATITE ON 316L
STAINLESS STEEL

G. García, CINVESTAV, Unidad Saltillo, Coahuila, México

ELECTROPHORETIC DEPOSITION OF A NATURAL WOLLASTONITE ON 316L STAINLESS STEEL FROM
DIFFERENT DISPERSING MEDIA

H. H. Rodríguez, CINVESTAV, Unidad Saltillo, Coahuila, México

ELECTROPHORETIC DEPOSITION OF SOL-DERIVED ZINCITE NANOPARTICLES ON CONDUCTIVE
POLYMERS

Rudolf C. Hoffmann, Max-Planck-Institute for Metals Research, Germany