

ISE 2017 Annual Report

ISE Division 4 – Electrochemical Material Science

1. Division Officers

Chair: Giovanni Zangari (gz3e@virginia.edu), U. of Virginia
Past Chair: S. R. Brankovic (SRBranko@uh.edu), U. of Houston
Chair Elect: Monica Santamaria (monica.santamaria@unipa.it), Università' di Palermo
Vice Chairs: Chi-Chang Hu, National Tsing-Hua University, Taiwan
Mikhail Vorotyntsev, M.V. Lomonosov Moscow State University

Activities of Division 4 in 2017

2. Organization and co-organization of symposia at the annual ISE meeting

68th ISE Annual Meeting, 27 August – 1 September, Providence, RI, USA (2017)

- Division 4 has organized and sponsored directly 3 symposia (# 8, 9, 10), and co-sponsored one additional symposium (# 11, with Division 6).
- Division 4 has sponsored student poster awards in each of the symposia.

Symposium 8: **Dealloying: Fundamentals, Application, and Control**

Sponsored by: Division 4, Electrochemical Materials Science

Dealloying studies have recently found a growing base among many different disciplines where a nanoscale bicontinuous morphology is essential to perform function. The selective dissolution of a less noble component from binary or ternary alloys has been shown to be of interest also as a fabrication route for high surface to volume ratio materials and structures with applications in catalysis, energy storage, electronics, sensing, separations, and others. This symposium provides a forum for discussion of fundamental processes controlling the morphology evolution during dealloying and its applications in different fields. The relation between dealloying conditions and resulting material properties are discussed, benefiting from the synergy between well-designed experiments and theory and simulations.

Symposium Organizers

Nikolay Dimitrov (Coordinator), SUNY at Binghamton, USA dimitrov@binghamton.edu

E. Jennings Taylor, Faraday Technologies, USA

Natasa Vasiljevic, University of Bristol, UK

Thomas Moffatt, NIST, USA

Symposium 9: **Ionic liquids as Media for Electrochemical Synthesis**

Sponsored by: Division 4, Electrochemical Materials Science

This symposium will discuss latest results on the use of ionic liquids (ILs) in electrochemical reactions. Such processes usually exploit the large electrochemical windows of ILs. Both experimental and theoretical papers are welcome. Examples include the electrodeposition of reactive metals such as aluminum, tantalum, niobium, titanium, or of other metals, semiconductors, alloys that cannot be electrodeposited from aqueous electrolytes, as well as applications of ILs for energy conversion and storage. Papers on new analytical methods, such as in situ Raman Spectroscopy, Atomic Force Microscopy, Scanning Tunneling Microscopy or X-Ray Photoelectron spectroscopy, used for (in situ) characterization of the electrochemical process in ILs are encouraged. Theoretical approaches could discuss the structure and dynamics of the bulk and the electrode-electrolyte interfaces of ILs.

Symposium Organizers

Roberto Torresi (Coordinator), Univ. de Sao Paulo, Brazil rtorresi@iq.usp.br

Charles Hussey, University of Mississippi, USA

Andreas Bund, Technische Universitaet Ilmenau, Germany

Symposium 10: **Corrosion: Fundamentals, Passivity, and Prevention**

Sponsored by: Division 4, Electrochemical Materials Science

The goal of this symposium is to address the range of issues pertinent to corrosion and passivity. The breadth of the topic is intended to cover the latest developments, with particular focus on new scientific advances regarding: corrosion, passive films, in-situ corrosion measurements, and corrosion in harsh environments (e.g. nuclear, biological environments). Topics in closely related areas will also be considered, including environmentally assisted corrosion, corrosion modeling and the advanced characterization of corrosion.

Symposium Organizers

Scott Lillard (Coordinator), University of Akron, USA lillard@uakron.edu

David Shifler, Naval Research Lab, USA

Nick Birbilis, Monash University, Australia,

Homero Castaneda, Texas A&M University, USA

Symposium 11:

Synthesis and Applications of Electrochemically Active Materials

Sponsored by: Division 4, Electrochemical Materials Science. Division 6, Molecular Electrochemistry

This symposium will cover all aspects of electrochemically active materials as well as molecular

and supramolecular architectures, ranging from their modeling and syntheses and characterization to various applications in functional electrodes (electrochemical energy conversion and storage, sensors, actuators, micro/nanoelectronics, electrochromic devices, etc.). The materials under discussion include, but are not limited to, conjugated and redox-active polymers, ion-intercalation solids, carbon-based and other highly porous materials, nanostructured and functionalized surfaces and thin layers, and electrocatalysts.

Symposium Organizers

Francesco Paolucci (Coordinator), University of Bologna, Italy francesco.paolucci@unibo.it

Mikhail A. Vorotyntsev, D. Mendeleev University of Chemical Technology, Russia

Ross Milton, University of Utah, USA

Giovanni Zangari, University of Virginia, USA

3. Topical Meetings

24th ISE Topical Meeting, Merida, Mexico, April 7-10, 2019

- Division 4 and Division 6 are co-organizing and co-sponsoring the 24th ISE Topical Meeting “Electrochemical assembling at the meso, nano and molecular scale”
- Co-organizers proposed by Division 4 include
Brankovic, Stanko, U. of Houston, USA
Breugelmans, Tom, U. of Antwerp, Belgium

22nd ISE Topical Meeting, Tokyo, Japan, April 15-18 2018.

- Division 4 and Division 5 are co-organizing and co-sponsoring the 22nd ISE Topical Meeting “Materials Engineering and Process Optimization at Electrified Solid/Liquid Interfaces”
- Co-organizers proposed by Division 4 include
Hu, Chi-Chang, National Tsing-Hua University, Taiwan
Zangari, Giovanni, U. of Virginia, USA

20th ISE Topical Meeting, Buenos Aires, Argentina, 19-22 March, 2017

- Division 4 has approved additional funds to sponsor ISE topical meeting “Advances in lithium and hydrogen electrochemical systems for energy conversion and storage” in Buenos Aires, Argentina in 2017 (Total **1000** Euro). Funds can be used only to increase the participation of students.
- Organizing Committee
Agustin E. Bolzan, La Plata, Argentina (co-chair)
Candace Chan, Tempe, USA
Deborah Jones, Montpellier, France
Robert Kostecki, Berkeley, USA
Ezequiel P.M. Leiva, Cordoba, Argentina (co-chair)
Yan Yao, Houston USA

4. Sponsored Meetings

Division 4 sponsored the following meetings in 2017

- 3rd International Workshop on Advanced Batteries, Accumulators and Fuel Cells. Brno, Czech Republic, 10-13 September, 2017. Division 4 sponsors a “best poster of young scientists” competition.
- 3rd International Workshop on Nanomaterials for Energy Conversion, Ho Chi Min City, Vietnam. Division 4 sponsors general expenses to promote internationalization of electrochemical research.

5. Division Poster Awards

Poster Awards are planned for the 68th ISE Annual Meeting in Providence. One poster award per each sponsored symposium will be provided. The poster award provides for USD 300 plus a ticket for the meeting dinner.

The Division is also planning for prospective poster awards at future topical meetings.

6. Chaired and sponsored ISE prizes

- *ISE-Prize for Electrochemical Material Science (Total 1000 Euro)*
The prize is awarded annually to a young electrochemist on the basis of published work in the field of corrosion, electrodeposition or surface treatment.
Recipient for 2017: Dr. Csaba Janaky, Hungarian Academy of Sciences
- *ISE Elsevier Prize for Applied Electrochemistry*
The Chair of Division 4 was in the selection committee for the above ISE Prize.

7. Contribution to *Electrochimica Acta* Special Issues

In the context of the 68th Annual Meeting, Division 4 will contribute to the *Electrochimica Acta* Special Issue with the following guest editors:

Symposium 8: Nikolay Dimitrov

Symposium 9: Rpberto Torresi

Symposium 10: Nick Birbilis

Symposium 11” Mikhail A. Vorotyntsev