

Scientific Program

Israelectrochemistry 2014, Tuesday, Sept. 16 2014
David Wang Auditorium, 3rd floor of Dalia Meidan Building at the Materials
Science & Engineering Department, Technion Haifa

8:00 – 9:00 Gathering and registration: posters session and vendor exhibition

9:00 – 9:05 Opening remarks

9:05 - 11:00 Morning Session 1

9:05 – 9:30 Invited 1 Novel Electrochemical Systems for Energy Storage and Water Desalination Leveraging Flow-through Porous Media
Matthew E. Suss, *Department of Chemical Engineering, MIT, USA;*
Faculty of Mechanical Engineering, Technion – Israel Institute of Technology, Israel

9:30 – 9:45 Talk 1 Electrodeposition as an Universal Tool for Making Metallic Surfaces Slippery
Alexander B. Tesler^{1,2}, **Philseok Kim²** and **Joanna Aizenberg^{1,2,3*}**
¹School of Engineering and Applied Sciences, ²Wyss Institute for Biologically Inspired Engineering and ³Kavli Institute for Bionano Science and Technology, Harvard University, Cambridge, MA 02138, USA

9:45 – 10:00 Talk 2 Water Splitting by Artificial Photosynthesis Using Iron Foam Photoanodes Coated with Catalytic Self-Assembled Graphene-Manganese Porphyrin Structures
Amir Kaplan, **Eli Korin** and **Armand Bettelhiem**, *Chemical Engineering Department, Ben Gurion University of the Negev*
P.O box 653, Beer-Shave84105, Israel

10:00 – 10:15 Talk 3 Metal Organic Complexes as Redox Candidates for Carbon Based Pseudo Capacitors
Arie Borenstein, **Ohad Felker**, **Shalom Luski** and **Doron Aurbach**,
Chemistry Department, Bar Ilan University
Ramat Gan, 5290002 Israel

10:15 – 10:30 Talk 4 Li-S Cathodes with Extended Cycle Life by Sulfur Encapsulation in Disordered Micro-porous Carbon Powders
Ariel Rosenman^a, **Ran Elazari^a**, **Gregory Salitra^a**, **Doron Aurbach^a** and **Arnd Garsuch^b**
[a] Department of Chemistry, Bar-Ilan University, Ramat-Gan, 52900, Israel
[b] BASF SE, Ludwigshafen, 67056 Germany

10:30 – 10:45 Talk 5 Aluminum Activation in Ionic Liquids
D. Gelman¹, B. Shvartsev², I. Lasman², I. Krossing³, F. Scholz³ and Y. Ein-Eli^{*1, 2}
1. The Nancy & Stephan Grand Technion Energy Program (GTEP), Technion-Israel Institute of Technology, Haifa 3200003 Israel
2. Department of Materials Science and Engineering, Technion- Israel Institute of Technology, Haifa 3200003 Israel
3. Institut für Anorganische und Analytische Chemie, University of Freiburg Albertstr. 21, D-79104 Freiburg,- GMBH

10:45 – 11:00 Talk 6 Novel Aluminum Air Ionic Liquid Based Battery
D. Gelman^{a,b*}, B. Shvartsev^{b*} and Y. Ein-Eli^{a,b}
^a The Nancy and Stephen Grand Technion Energy Program, Technion-Israel Institute of Technology, Haifa Israel 3200003.
^b Department of Materials Science and Engineering, Technion- Israel Institute of Technology, Haifa Israel 3200003

11:00 -11:30 Coffee break, posters session and vendor exhibition

11:30 – 13:00 Morning Session 2

11:30 – 11:55 Invited 2 Electrically Wired Photosynthetic Reaction Center Electrodes for Photo-Bioelectrochemical Cells
Ran Tel-Vered,^a Omer Yehezkeili,^a Ariel Efrati,^a Rachel Nechushtai,^b Itamar Willner^a
(a) Institute of Chemistry; (b) Silberman Institute of Life Sciences The Hebrew University of Jerusalem, Jerusalem, 91904, Israel

11:55 – 12:10 Talk 7 First –Principle Classical and Quantum Study of Cathode Materials for Rechargeable Batteries
Dan T. Major, Doron Aurbach, Boris Markovsky, Hamutal Engel, Vijay Singh, Mudith Dixit, Monica Kosa, Department of Chemistry and the Lise Meitner-Minerva Center of Computational Quantum Chemistry and the Institute for Nanotechnology and Advanced Materials, Bar-Ilan University, Ramat-Gan 52900, Israel

12:10 – 12:20 Talk 8 Determination of Hydraulic Power Losses in Vanadium Redox Batteries Based on Experimental Analysis of Electrolyte Flow through Carbon Felt of Electrodes
A. Pozin¹, M. Averbukh^{1,2}, S. Sukoriansky¹,
1-University Ben-Gurion of the Negev, ISRAEL
2- University Ariel

12:20 – 12:35 Talk 9 High Quality Metallic Grid Preparation on Large Area ITO-Coated Plastic Substrates
Larissa Grinis and Arie Zaban, Institute of Nanotechnology & Advanced Materials, Bar-Ilan University, Ramat Gan, 52900, Israel

12:35 – 13:00 Invited 3 Highly efficient Hole conductor free perovskite based solar cells
Lioz Etgar, The Hebrew University of Jerusalem, Jerusalem.

13:00 – 14:20 Lunch, posters session and vendor exhibition

14:20 – 16:25 Afternoon Session 1

14:20 – 14:45 Invited 4 Non-Precious Metal-Based Catalysts for Oxygen Reduction in PEM Fuel Cells – Is this Just a Dream?
Lior Elbaz, Department of Chemistry, Bar-Ilan University, Israel

14:45 – 15:00 Talk 10 The Effect of Lithium Bis(oxalate)borate and Vinylene Carbonate on the Surface Chemistry of Lithium Ion Battery Electrodes
Evan M. Erickson, S. Francis Amalraj, Chandan Ghanty, Hadar Sclar, Onit Srur-Lavi, Boris Markovsky and Doron Aurbach, *Chemistry Department, Bar-Ilan University, Ramat-Gan, Israel*

15:00 – 15:15 Talk 11 Development and Characterization of a Polymer-in-Ceramic Battery Membrane
R. Blanga¹, G. Ardel¹, K. Freedman¹, D. Golodnitsky^{1,2*}, and E. Peled¹
1 – School of Chemistry; 2 - Wolfson Applied Materials Research Center, Tel Aviv University, Tel Aviv, 69978, Israel

15:15 – 15:30 Talk 12 Electrochemical Direct Diagnosis of Cancer and Monitoring of Anti-Cancer Drug Efficacy
Judith Rishpon, Tova Neufeld, Rachela Popovtze *, Michal Mosberg, Sefi Vernick* and Yossi Shacham-Diamand *
Biotechnology, Tel-Aviv University, Tel-Aviv, Israel
**Electrical Engineering, Tel-Aviv University, Tel-Aviv, Israel*

15:30 – 15:45 Talk 13 Core-Shell Cu-Si Nanowire Embedded Si Thin Film As Anode Materials For Lithium Ion Batteries
Junfeng Yang, Alexander Kraytsber, Gary Frant, Yair Ein-Eli,
Department of Materials Engineering, Technion-Israel Institute of Technology Haifa, 32000 Israel

15:45 – 16:00 Talk 14 Electrochemical Characterization of the Photovoltaic Cells by using the new LED Kit from Metrohm-Autolab
Martijn van Dijk¹, Eran Golik²
1-Metrohm Autolab BV Kanaalweg 29G, 3526KM, Utrecht, The Netherlands
2-Dr. Golik Chemical Instrumentation, 34 Kibbutz Galuyot st. Tel-Aviv ISRAEL 66550

16:00 – 16:25 Invited 5 Modeling of materials and processes for Li-Air and Na-Air batteries
Amir Natan, Department of Physical Electronics, Tel-Aviv University, Israel

16:25 – 16:45 Coffee break, posters session and vendor exhibition

16:45 – 18:15 Afternoon Session 2

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| 16:45 – 17:00 | Talk 15 | Multi-Cage Mixed-Conductor Matrix (MCMC)
Encapsulating Li₂S as Cathode for Lithium/Sulfur Batteries
<u>Meital Alon¹</u> , <u>Emanuel Peled¹</u> , <u>Diana Golodnitsky^{1,2}</u>
<i>1-School of Chemistry, 2-Wolfson Applied Materials Research Center
Tel Aviv University, Tel Aviv 699780, Israel</i> |
| 17:00 – 17:15 | Talk 16 | Liquid-Free Lithium-Oxygen Battery
<u>Moran Balaish^a</u> , <u>Emanuel Peled^b</u> , <u>D. Golodnitsky^b</u> and <u>Yair Ein-Eli^{a,c*}</u>
<i>^a Grand Technion Energy Program (GTEP), Technion-Israel Institute of Technology, Haifa 3200003 Israel;
^b School of Chemistry, Tel Aviv University, Tel Aviv 69978 Israel;
^c Department of Materials Science and Engineering, Technion-Israel Institute of Technology; ^b School of Chemistry 32000, Israel.</i> |
| 17:15 – 17:00 | Talk 17 | Study of Ethylene-Glycol-Based Electrolytes for High-Temperature Sodium-Oxygen Battery.
<u>Roni Hadar^a</u> , <u>Meital Goor^a</u> , <u>Evelina Faktorovich Simon^a</u> , <u>Diana Golodnitsky^{a,b}</u> and <u>Emanuel Peled^a</u>
<i>^a School of Chemistry, Tel-Aviv University, ^b Wolfson Applied Materials Research Center, Tel-Aviv University, Tel-Aviv 69978, Israel</i> |
| 17:30 – 17:45 | Talk 18 | Current-Voltage Relations and Defect Distribution in Metal₁ Mixed Ionic Electronic Conductor Metal₂ Devices
<u>Dima Kalaev</u> , <u>Ilan Riess</u> , <i>Physics Department, Technion, Haifa 3200003, Israel</i> |
| 17:45 – 18:00 | Talk 19 | Concentration Polarization and Electroconvection in Heterogeneous Permselective Systems
<u>Yoav Green</u> , <u>Sinwook Park</u> and <u>Gilad Yossifon</u> , <i>Faculty of Mechanical Engineering, Micro- and NanoFluidics Laboratory, Technion –Israel Institute of Technology, Technion City 32000, Israel</i> |
| 18:00 – 18:15 | Talk 20 | Structural and Electrochemical Evidence of Layered to Spinel Phase Transformation of Li and Mn Rich Layered Cathode Materials Upon Cycling
<u>Prasant Kumar Nayak</u> , <u>Judith Grinblat</u> , <u>Mikhael Levi</u> , <u>Boris Markovsky</u> , <u>Doron Aurbach</u> , <i>Department of chemistry, Bar-Ilan University, Ramat-Gan, Israel 52900</i> |
| 18:15 – 18:30 | | Announcement of awards for the best students' presentation and posters Closing |