



The 20th International Conference on Advanced Batteries, Accumulators, Fuel Cells and Special Electrochemical Technologies

Program of Lectures and Posters

ORGANISED BY BRNO UNIVERSITY OF TECHNOLOGY AND CO-SPONSORED BY

The International Society of Electrochemistry



The Electrochemical Society



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Sunday, August 25th

17:00 – 20:00 **Registration and Get-Together Party**

Monday, August 26th

8:00 **Registration**

9:30 **Opening of ABAF 20th**

Prof. RNDr. Vladimír Aubrecht, CSc.
Dean of Faculty of Electrical Engineering and Communication

Assoc. Prof. Ing. Marie Sedlářiková, CSc.
ABAF 20th Conference Chairman

Ing. Tomáš Kazda, Ph.D
ABAF 20th Conference Vice-Chairman

Ing. František Klein
Organisation Committee

10:00 *Assoc. Prof. Miroslav Fojta*
International Society of Electrochemistry
A Look at the Present with Our Vision for the Future

Michael Doležal
Grant Opportunities and Networking with Scientists

10:20 **Coffee Break**

Lithium Batteries and Related Systems I

10:30 – 11:30 *B. Markovsky*
Some Aspects of Positive Electrodes for Lithium-Ion Batteries: Progress of
Research in Bar-Ilan University

E. Shembel
Innovating Binder Free Silicon Based Electrode is Promising Anode for
Stable and Safer Lithium-Sulfur Batteries Technology & Equipment for
Production. Electrochemical Properties Electromagnetic Non-Destructive
Testing

S. Bodoardo
Strategies to Improve Lithium Sulfur Batteries Performance

11:30 **Time for Lunch**

12:15 – 13:15 **Poster Section** (+Best Poster of Young Scientists Competition)

13:20 – 14:20 *T. Kazda*
Properties of Materials for Post-Lithium-Ion Batteries

M. Kasprzyk
The Study of New Non-Crystallizing Solvents and Lithium Electrolytes

S. A. Kirillov
Nanosized Electrode Materials for Lithium-Ion Batteries Obtained By Means of a Citric Acid Aided Route: Advantages and Shortcomings

14:20 **Coffee Break**

14:30 – 15:30 *M. Zukalová*
Advanced Anode and Cathode Materials for 48 V Lithium Accumulators

I. Kirsanova
Features of Influence the Temperature on the Electrochemical Parameters of Li- Battery With Cathode Based on Polymer Sulfur. Impedance and Galvanostatic Cycling

Y. Polishchuk
Innovating Cathode Based on Polymer Sulfur for Stable and Safer Lithium-Sulfur Batteries

15:30 **Coffee Break**

15:40 – 16:40 *M. M. S. Sanad*
Improving the Electrochemical Performance of Spinel Cathode Materials for High Voltage Li-ion Batteries

A. Markevych
Innovating Sulfur Based Electrode and Modified Lithium Electrode for Stable and Safer Lithium-Sulfur Batteries. Cycling, Impedance, Non-Destructive Testing, Construction

L. Niedzicki
Anion Structure Influence on Li-Ion Electrolyte Properties. Model Electrolytes, New Salts, Non-Fluorine Electrolytes

17:00 **Brno Walking Tour with Guide**
Departure from Hotel Continental 17:00 (to Mamut Pub)
or
Walk / Transport to Social Evening
Departure from Hotel Continental 18:00 (walking or car)

18:30 **Mamut Pub Restaurant**
Dinner and Social Evening



Tuesday, August 27th

Lithium Batteries and Related Systems II

8:30 – 9:30 *K. Fröhlich*
Linking Crystallographic and Electrochemical Properties of Layered Oxide Cathodes

S. N. Eliseeva
Electrochemical Properties of $\text{Li}_4\text{Ti}_5\text{O}_{12}$ with Conductive Binder

O. V. Kolomoiets
Solid Polymer Electrolyte for Improving the Safety of Lithium-Sulfur Battery

9:30 **Coffee Break**

9:40 – 10:40

V. Redko

Conductivity of Powders Graphene, Graphite, Oxides, Sulfides, etc. of Electrode Materials are Critical Parameters for Efficiency Li Batteries. Non Destructive Electromagnetic Testing. Electrochemical Properties

Supercapacitors

G. Lota

Electrochemical Supercapacitor with Thiourea-Based Aqueous Electrolyte

K. Lota

Chitosan as a Precursor for N-reached Carbon Electrode Materials in Electrochemical Capacitor Application

10:40

Coffee Break

10:50 – 11:50

J. Wojciechowski

The Influence of the Modification of Current Collectors on the Electrochemical Capacitor Parameters

D. Bhattacharjya

Effect of Electrode Processing and Cell Assembly on the Performance of Supercapacitor in Prototype Pouch Cell Format

L. Kolanowski

Electroactive Materials Doped by Heteroatoms for Energy Storage and Conversion

11:50

Time for Lunch

Fuel Cells

12:45 – 13:45

M. Gras

The Impact of Thiourea Addition on the Borohydride Hydrolysis Reaction

R. Pittkowski

Synergy in Lanthanide Stabilized Ru and Ir Porphyrins as Electrocatalysts for the Oxygen Evolution Reaction (OER)

Nickel–Metal Hydride

L. Kolanowski

Factors Affecting the Performance of Negative Electrode for Ni-MH Cell

14:00

Macocho Caves Tour

Excursion and Dinner

Departure from Hotel Continental 14:00



22:00

Lightning Show

Brno Technical University Venue

Wednesday, August 28th

New Systems of Batteries

8:30 – 9:30

A. V. Potapenko

Nanosized $\text{NaNi}_{0.5}\text{Mn}_{0.3}\text{Co}_{0.2}\text{O}_2$ as a Cathode Material for Sodium-Ion Batteries

J. Charvát

Optimization of Felt Compression for High Performance VRFB Stack

V. D. Noto

Innovative Electrolytes for Secondary Lithium and Magnesium Batteries

9:30

Coffee Break

9:40 – 10:40

H. Hoster

Lithium Intercalation Thermodynamics: Do We Think that We Understand Graphite?

Application of Batteries for Electromobility and Industry, Simulations

B. Kossl

Evaluation of Internal and External Sensor Measurements for Determining the State-of-Charge and State-of-Health of Li-Ion Pouch Cells

B. Polnik

Tests of the HK-1 Module of the Mobile Mining Machine

10:40 **Coffee Break**

10:50 – 11:50

M. Mačák

Modelling of Cyclic Voltammetry

J. Marušinec

Types of Batteries in Present Electric Cars

P. Janderka

Pragolab, Bio-Logic: New Electrochemical and Scanning Instrumentation from Bio-Logic SAS

J. Vejbor

EVC Lithium Traction Batteries Outside Automotive Applications

11:50 – 12:50

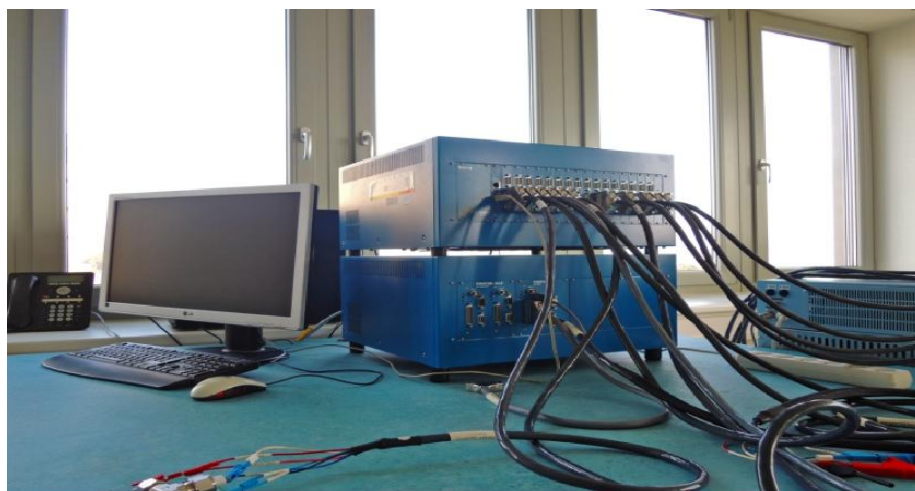
Poster Section (+Best Poster of Young Scientists Competition Voting)

12:50 – 13:45

Time for Lunch

13:45 – 16:00

University Laboratories Excursion – Department of Electrical and Electronic Technology, FEEC, Brno University of Technology



Departure from the Conference Premises

16:30

Departure from Hotel Continental to Restaurant Thalie

17:00

Restaurant Thalie Brno
Dinner and Closing Ceremony



List of Posters

Lithium Batteries and Related Systems

R. Apostolova: Effect of Superhalogen Anions on the Electrochemical Behavior of V₂O₅ Electrodes in Redox Reactions with Lithium in EC-DMC/Li-Salt Solutions

R. Apostolova: Synthesis of Ag-Vanadates Obtained by Ion Change on the Base of Electrochemically Synthesized V₂O₅-x·yH₂O and the their Behavior in the Electrodes for Lithium Accumulator

D. Capková: Effect of Carbon Materials for Electrochemical Properties for Lithium-Sulfur Batteries

Q. Cheng: Controllable synthesis of Fe₂O₃/rGO/MXene composites as anode materials for lithium ion batteries

M. Fíbek: Graphite Electrode: Influence of Binders on Electrochemical Properties

K. Karmazínová: Effect of Ambient Environment on Different Types of Li-Ion Cathode Materials

S. S. Madani: An Analytical Solution for Lithium-Ion Batteries Cooling

S. S. Madani: Thermal Analysis of an Indirect Liquid Cooling with Different Geometries for a Lithium-ion Battery

M. G. Ortiz: Improved Electrochemical Performance of NCM Cathode Materials Based on the Modification of the Salt Content in the Electrolyte

E. Vargun: Reduced Graphene Oxide-MWCNT Organogel Foam for Lithium-Sulfur Battery Cathode

I. Veselkova: Gel Polymer Electrolytes Based on Methyl Methacrylate Modified Flame Retardants

I. Veselkova: Using Copolymers in Gel Polymer Electrolytes

Fuel Cells

M. Carda: Impact of Morphological And Structural Changes On Performance Of Solid Oxide Cells

M. O. Danilov: Electrochemical Synthesis Partially Unzipped Multi-Walled Carbon Nanotubes as Electrode Materials for Fuel Cells

M. Ľuba: Hydrogen Evolution Reaction on Iridium-Modified Nickel Foam Surfaces

M. Míka: New Hybrid Polysiloxane Membranes for Fuel Cells

Aqueous Batteries

P. Křivík: In Situ and Ex Situ Measurements of Lead Acid Battery Cell by PEIS

V. Petrova: Ultrasound Assisted Mixing of Zinc Active Mass with Conductive Ceramic Additives for Ni-Zn Battery

J. Zimáková: Combined Effect Of Fiberglass And TiO In Negative Active Mass Of Lead-acid Accumulator

New Types of Batteries

O. Čech: Anatase as Anode for Sodium-Ion Cells

N. I. Globa: Electrolytes for Sodium-Ion Batteries

J. Libich: Sodium Titanate Material for Sodium-Ion battery

J. Máca: Optimalization of Negative Electrode for Sodium Ion Accumulators

Y. Shmatok: Lithium Manganese Spinel as Cathode Materials for Sodium-Ion Batteries

V. Sirosh: Sodium Rhodizonate as Cathode Material for Sodium-Ion Batteries

Supercapacitors

H. Fei: Graphite interlayer for reduced graphene oxide hydrogel in high-rate supercapacitors

Photovoltaics

D. Benda: Integrated Circuits for Charging Batteries from the Photovoltaic Panel

J. Vaněk: Effect of Replacing a Faulty Module with a Different Power Module to the Total PV Power Rating

Other Technology, Applications and Simulations

S. Bartoszek: Active Balancing System of Lithium Cell Batteries Used in Drive Units of Mining Machinery

R. Bayer: Design of the Proper Shape of the Aperture for Optic Measuring Methods in Experimental Chamber

M. Ceylan: A Temperature Dependent Model for Li₂TiO₃ / NMC Batteries

- M. Chalupa*: The Passability of the Track Vehicle
- R. Cipín*: Estimation of SOC of Li-Ion Batteries
- P. Deja*: Protective and Control Systems of Lithium-Ion Cells
- D. Dobrocký*: Surface Structure Evaluation of Functional Surfaces after Plasma Nitriding
- S. N. Eliseeva*: Effect of Cycling Ageing on Impedance Spectra of LiMn_2O_4 -electrodes
- P. Faltejsek*: Corrosion Resistance of Plasma Nitrided Ferritic Steels X12Cr13 and X6Cr17
- P. Hlavatá*: Comparative Analysis of Inserted Temperature Probe in the Differentially Pumped Chamber
- D. Kusmič*: Corrosion Resistance of Plasma Nitriding and Zinc Phosphating Duplex System for C45 Steel
- K. Lota*: Renewable Energy System Combined with Hybrid Energy Storage Devices
- M. Mačák*: Numerical Simulation of Galvanic Corrosion
- S. S. Madani*: Analyzing Discharging and Charging Performance of a Lithium-ion Battery
- A. Maxová*: Comparison of the Solver Setting in Ansys Fluent System
- I. Pazdera*: Hybrid Tree Harvester Machine with Battery Powered Hydro-electric Drive
- P. Pilát*: Using of Fuel Cell in Micro-Cogeneration Unit
- Z. Pokorný*: The Influence of Alloying Elements on Surface Hardness of Ferritic Nitrocarburizing Layers of Barrels
- M. Sedlaříková*: Materials for Biodegradable Implants Prepared by Powder Metallurgy
- K. Stankiewicz*: Intelligent Routing Algorithms in the Complex Sensors Network for Control Energy Storage
- M. Svoboda*: Response of the Human Musculoskeletal System when Driving in a Passenger Car
- M. Toman*: Dynamic Thermal Model of a Cylindrical Battery Cell
- P. Vorel*: Simple BMS Circuit and Charger for a Li-Ion Battery Pack 12 V
- J. Zimáková*: Monitoring of Temperature Influence on Properties of Lead-Acid Accumulators

Notes

