



**The 27th 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



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We would like to express our thanks to the Brno University of Technology, Faculty of Electrical Engineering and Communication for support and help with organising 27th ABAF conference

Sunday, August 23rd

17:00 – 20:00

Registration and Get-Together Party at Technická 3082/12

Transport from Hotel Continental at 17:00 and 18:00

Monday, August 24th

8:00

Registration at Technická 3082/12

Transport I. from Hotel Continental to Conference Premises at 8:10
(for non-registered participants)

Transport II. from Hotel Continental to Conference Premises at 8:40
(only for participants registered on Sunday)

9:00

Opening of ABAF 27th

prof. Ing. Jaroslav Koton, Ph.D.

Dean of Faculty of Electrical Engineering and Communication, BUT

Prof. Ing. Tomáš Kazda, Ph.D

Organisation Committee

Assoc. Prof. Ing. Marie Sedlářiková, CSc.

Organisation Committee

Ing. František Klein

Organisation Committee

9:30

Prof. T. Navrátil

International Society of Electrochemistry

Lithium Systems

9:40 – 10:20

D. Bresser

Towards an in-depth understanding of the interfacial reactions of lithium-metal electrodes

S. Atay

Investigation of Material Aging in High-Energy, High-Power Lithium-Ion Cells

10:20

Coffee Break

10:40

M. Doležal

Project CEIPEX – a Grant Opportunity in Brno

New Battery Systems

10:50 – 12:10

D. McNulty

Engineering Carbon-Sulfur Hosts for Lithium–Sulfur Batteries

J. Wojciechowski

Synergistic Effects of Imidazolium Ionic Liquids and Palladium Nanoparticles on the Durability of Ni–MH Battery Negative Electrodes

J. Zhu

Redox mediators for Li-oxygen batteries

K.D. Pershina

Diffusion Behavior of Sodium Ions in TiO₂ and MnO₂ Electrodes at the Electrode/Electrolyte Interface with a Non-Aqueous Electrolyte

12:10

Time for Lunch

13:30 – 14:50

A.S. Fedorková

Development and Multiphysics Optimization of Next-Generation Flow Batteries with Hybrid Lithium-Sulfur (Li-S) Integration for Large-Scale Energy Storage

Fuel Cells

V. Komanicky

Magnetron sputtered thin film electrocatalysts for electrolyzers and fuel cells

Aqueous Batteries

Y. He

Operando Thermography-Assisted Mapping of Interfacial Current Distribution in Electrochemical Batteries

G. Abbas

In-situ/operando characterizations for electrochemical ionic intercalation in Zn-Gr dual ion batteries

14:50

Coffee Break

15:10 – 16:50 **Poster Section** (+Best Poster of Young Scientists Competition)

17:00 Walk from Conference Premises to Restaurant Charlie's Park

17:15 **Charlie's Park Restaurant**
Dinner and Social Evening



Tuesday, August 25th

8:30 **Registration at Technická 3082/12 – for non-registered participants**
Transport I. from Hotel Continental to Conference Premises at 8:10
Transport II. from Hotel Continental to Conference Premises at 8:40

Applications and Simulations

9:00 – 10:20 **G. Lota**
Safety Requirements and Standards for Lithium-Ion Batteries

Ł. Kolanowski
European Lithium-Ion Battery Market: Challenges and Opportunities

O. Mušálek
Design and Development of an Electrochemical Test Cell for Energy Storage Research

O. Klvač
Workflow for SEM Characterization of Battery Cross-Sections

10:20 **Coffee Break**

10:40 – 12:00 **J. Moškon**
Electrochemical Impedance Spectroscopy for Battery Systems: Transport, Kinetics, and Aging

J. Libra
From Lab EIS to Industrial Battery Diagnostics

L. Novák
Cathode Materials Development using in-situ Scanning Electron Microscopy

V. Knap
Reducing Charging Stress and Cold-Charging Exposure in CubeSat Batteries

12:00 **Time for Lunch**

13:20 – 14:40 **J. Meindl**
Advanced BioLogic Solutions for Battery and Fuel Cell Research

M. Sedlařík
From Ageing to Thermal Runaway in Battery Energy Storage Systems

M. Novák

Degradation-Resolved Electro-Thermal Characterization of High-Power Lithium-Ion Cells for Physics-Informed Sensorless Internal Temperature Estimation

M. Galasso

Multi-Species Multi-Reaction Model Parametrization of a Commercial NCA Positive Electrode from Half-Cell Open-Circuit Potential Data

14:40

Coffee Break

14:50 – 15:50

Poster Section (+Best Poster of Young Scientists Competition)

15:50

Transport to Hotel Continental

16:30

Transport from Hotel Continental to Water Tanks under Žlutý Kopec

16:45

Water Tanks under Žlutý Kopec
Excursion



18:10

Departure to ***Restaurant Železná růže***

18:20

Restaurant Železná růže
Dinner and Social Evening

20:20

Departure from ***Restaurant Železná růže***

20:45

Brno Observatory and Planetarium
Tesla Coil Show + Voyager: The Neverending Journey 3D

Wednesday, August 26th

8:30 **Registration at Technická 3082/12 – for non-registered participants**
Transport I. from Hotel Continental to Conference Premises at 8:10
Transport II. from Hotel Continental to Conference Premises at 8:40

Lithium-ion Battery Applications

9:00 – 10:20 ***J. Vejbor***
Czech Battery Cluster – 4 Years of Achievements and Challenges.

J. Votava
High purity manganese products from the Chvaletice tailings.

P. Hanzl
Lithium mining and processing in the Czech Republic

K. Zelinka
Production of cathode material for sodium-ion batteries at Draslovka Kolín

10:20 **Coffee Break**

10:40 – 12:00 ***V. Zmítko***
Battery Safety Testing in the Tiyo Laboratory

T. Zikmund
The use of X-ray imaging for battery applications

D. Flidr
TU Brno Racing – Formula student

R. Janečka
Presentation of EVC Group activities

12:00 **Time for Lunch**

13:20 – 14:40 **University Laboratories Excursion** – Department of Electrical and
Electronic Technology, FEEC, Brno University of Technology

16:40 Departure from Hotel Continental to Restaurant Thalie

17:00

Restaurant Thalie
Dinner and Closing Ceremony



List of Posters

Lithium Batteries and Related Systems

J. Báňa: Recovery of Graphite from NMC Black Mass via Hydrometallurgical Leaching

D. Capková: Engineering Silicon-Graphite Anodes for High-Energy Lithium-Ion Batteries

T. Doležal: Realistic and Accelerated Battery Testing Based on Real-World Profiles

H. Hálová: Effect of Calcination Profile on the Structure, Morphology and Electrochemical Performance of Spray-Dried LiFePO₄ Cathode Materials

E. Jankowska: Effect Of Temperature On Degradation And Cycle Life Of Lithium-Ion Batteries

K. Jaško: Methodological Approach to EIS Measurement and Interpretation in Li-ion Batteries

J. Kramář: Data Processing of Correlative SPM-SEM NMC Cross-Section Measurements

K. Lota: Impact of Modifications on Thermal Stability of Lithium-Ion Battery Separators

M. Osińska-Broniarz: Giving Battery Metals a Second Life: High-Entropy Transition Metal Oxides for Advanced Li-Ion Battery Applications via Ultrasonic Spray Pyrolysis

H. Potopenko: Electrochemical parameters of lithium manganese iron phosphate with a graphene-containing binder

M. Šedina: The Effect of Mechanical Compression and Thermal Load on Capacity Decline in Lithium-Ion Cells

D. Trochta: Operando Scanning Electron Microscopy as a Multiscale Tool for Investigating Structural Degradation of Lithium-ion and post-Li-ion Batteries

Fuel Cells

M. Budáč: Microstructural Evolution of Ni-based Fuel Electrodes in Reversible Solid Oxide Cells

M. Carda: Optimization of Tape-Cast YSZ Electrolytes for Reversible Solid Oxide Fuel Cells

M. Danilov: Partially Unzipped Carbon Nanotubes with DNA - Hybrid Nanocomposites for Oxygen Electrodes of Alkaline Fuel Cells

S. Fomanyuk: Synthesis and optical properties of WO₃/Pt structure film

M. Paidar: Temperature Changes During Repeated Cooling of a Lead-Acid Battery

Aqueous Batteries

P. Křivík: Temperature Profiles in a Lead-Acid Battery During Charging When Ambient Temperature Changes

M. Paidar: Importance of Demineralized Water Production Method on Water Electrolysis Durability

Y. Shmatok: Cyclic Characteristics of Activated Carbon Anode in Hybrid System with LiMn_2O_4 Cathode and Aqueous-Organic Electrolyte

New Systems of Batteries

M. Gorobets: Electrochemical Intercalation of Na^+ and K^+ into Titanium Disulfide from NaSCN and KSCN Melts with Dimethyl Sulfone

J. Leščinský: Optimization of Electrolyte-to-Sulfur Ratio and Separator Selection for Enhanced Electrochemical Performance of Lithium–Sulfur Batteries

V. Niščáková: Toward Vanadium-Free Redox Flow Batteries: The Potential of Organic Electrolytes

A. Šimek: Walnut Shell-Derived Hard Carbon as an Anode Material for Na-ion Batteries

Photovoltaics

J. Vaněk: Standardized Infrared Thermography for High-Reliability Photovoltaic Systems

Corrosion, Applications and Simulations

J. Dokoupil: Effect of Reflow Profile Shape Above the Melting Point at a Constant Heating Factor on the Shear Strength of Solder Joint Systems for Battery Management System Application

M. Osińska-Broniarz: Life Cycle Assessment of Industrial Black Mass Production from Spent Lithium-Ion Batteries

M. Puš: On Diagnostics of Automotive Battery Module by Electrochemical Impedance Spectroscopy: Influence of State of Charge

M. Rae: Coupling of CFD and PBM Techniques for Enhanced Particle Dynamics Modelling of Slurry Mixing

L. Trnková: Effect of Polystyrene Carbon on Degradation Processes of Fe-Mg-C Composites

P. Vyroubal: Data-Driven State-of-Health Estimation of Li-Ion Batteries Using Gaussian Process Regression and Kalman Filtering

NOTES

