



26th
ABAF

BRNO 2025

Advanced Batteries, Accumulators
and Fuel Cells



FACULTY OF ELECTRICAL department of electrical
ENGINEERING and electronic technology
AND COMMUNICATION

**The 26th 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



 Springer

Monatshefte für Chemie - Chemical
Monthly

Main Sponsors:

SKODA

pragolab

CHROMSPEC

Other Sponsors:

agile
europe

BioLogic
Science Instruments



EXCgroup



KOVHUTĚ
Příbram

VERKON
společnost pro vaši laboratoř

Co-Sponsored by



 Springer

Monatshefte für Chemie - Chemical
Monthly

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 26th ABAF conference

Sunday, August 31st

17:00 – 20:00

Registration and Get-Together Party at Technická 3058/10

Transport from Hotel Continental at 17:00, 18:00 and 19:00

Monday, September 1st

8:00

Registration at Technická 3058/10

Transport from Hotel Continental to Conference Premises at 8:00
for non-registered participants

Transport from Hotel Continental to Conference Premises at 8:30
for participants registered on Sunday

9:00

Opening of ABAF 26th

Prof. RNDr. Vladimír Aubrecht, CSc..

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

M. Doležal

Project COFUND

Lithium Systems

9:50 – 10:30

J. Zhu

The application of synchrotron-based XRD and X-ray tomography in battery research

G. Abbas

Structural Insights for Transition Metal Sulfide/Carbon Composite Electrode for Li-ion Batteries: In-situ/Ex-Situ Characterizations

10:30 **Coffee Break**

10:50 – 12:10 ***G. Simha Martynková***
Optimizing Metal Recovery in Battery Recycling Using Advanced Ceramics

W. Al-shatty
Novel Battery recycling process: regeneration of the Anode for new batteries

M. Kasprzyk
Non-crystallizing systems with poly(propylene glycol)'s and organic carbonates as new solvents for lithium electrolytes

D. Capkova
Silicon Particles for Improved Energy Density Anodes in Lithium-Ion Batteries

12:10 **Time for Lunch**

New Battery Systems

13:20 – 14:20 ***M. Ceylan***
Entropy Profile for Sodium-ion Batteries

M. Zukalová
Macroporous carbon additive enhancing the cycling stability of Li-sulfur batteries

L. Niedzicki
Solid Polymer Electrolytes for Li-ion and Post-Li-ion Batteries Based on Novel Salts and Plasticizers

14:20 **Coffee Break**

Aqueous Batteries

14:40 – 15:20 ***P. Mazúr***
Multi-phase energy storage media for enhanced energy density of redox flow batteries

Y. He
Organic/water mixed electrolyte for dual-ion batteries

15:30 – 17:00 **Poster Section (+Best Poster of Young Scientists Competition)**

17:15

Walk from Conference Premises to Restaurant Jean Paul's

17:30

Jean Paul's Restaurant
Dinner and Social Evening



Tuesday, September 2nd

8:30 **Registration at Technická 3058/10 – for non-registered participants**
Transport from Hotel Continental to Conference Premises at 8:30

Aqueous Batteries

9:00 – 10:20 **H. Machhi**
Hierarchically Porous Metal-Organic Gel Hosting Catholyte for Limiting Iodine Diffusion and Self-Discharge Control in Sustainable Aqueous Zinc-I₂ Batteries

L. Kavan
Zn/Li Dual-Ion Batteries with Water-in-Salt Electrolytes

Fuel Cells

E. Petkucheva
DDM activated stainless steel electrodes for alkaline electrolysis

G. Borisov
Multilayered nickel-based gas diffusion electrodes for water electrolysis in Zero-Gap configuration

10:20 **Coffee Break**

Supercapacitors

10:40 – 12:00 **P. Gomez-Romero**
Hybrid Electrode Materials for Hybrid Energy Storage

Applications and Simulations

S. Bodoardo
Gigagreen project, sustainable cell manufacturing

B. Eschelmüller
Manufacturing Challenges in Battery Prototyping: A Case Study on NCA Upscaling

B. Rajagopalan
Advancing High-Energy Battery Technologies: Scaling High-Si and High-Ni NMC9055 Cells to Mass Production

12:00 **Time for Lunch**

13:00 – 14:00 ***T. Kazda***
Application of μ CT in battery analysis

M. Rae
Development of an effective second-life protocol for rechargeable batteries in hospitals

G. Kratošová
Assessing Battery Separator Integrity: Microscopy, Diffraction, and Safety Analysis

14:15 Transport to Hotel Continental

14:45 Transport from Hotel Continental to Museum of Industrial Railways

15:30 ***Museum of Industrial Railways Zastávka u Brna***
Excursion



17:30 ***Restaurant Harmonie Rosice***
Dinner and Social Evening

20:30 Departure to Brno University of Technology – Tesla Coil Show

21:30 Departure from Brno University of Technology to Hotel Continental

Wednesday, September 3rd

8:30 **Registration at Technická 3058/10 – for non-registered participants**
Transport from Hotel Continental to Conference Premises at 8:30

Lithium-ion Battery Applications

9:00 – 10:20 ***J. Meindl***
Precision, Performance, Power: The New BioLogic Battery Cyclers

J. Vejbor
Czech Battery Cluster – 3 Years of Achievements And Challenges.

J. Votava
High purity manganese products from the Chvaletice tailings

H. Hesaka
Manufacture of LiPF₆ using recycled Li sources and additives for LIBs using LiPF₆ as a raw material

10:20 **Coffe Break**

10:40 – 12:00 ***A. Slávik***
Real-time X-ray imaging of electrolyte movement in LIB cells during operation

B. Štěpánová
Research and development of technology for recycling waste lithium-ion batteries and subsequent treatment of process water

J. Rýc
Presentation of EVC Group activities

12:00 – 12:30 **Poster Section** - Best Poster of Young Scientists Competition Voting

12:30 **Time for lunch**

13:30 – 14:50 **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: Effect of Negative Electrode Calendering to Performance of Recycled Graphite

M. Bílek: Influence of Primary Electron Beam-Induced Material Heating

P. Čudek: Preparation and analysis of organic carbon for electrochemical power sources

H. Fei: Lithium iron oxide as the prelithiation additive for lithium iron phosphate battery

H. Hálová: Effect of Iron Precursor Selection on Spray Drying Synthesis of LiFePO_4 Cathodes

J. Hokkanen: Compatibility of high-voltage cathodes with ionic liquids

A. Hölzlhammer: Quasi-Solid-State Electrolytes: Enhancing the Future of Lithium-Ion Batteries

K. Jaško: Electrochemical Impedance Spectroscopy of Li-ion Batteries: Techniques, Challenges, and Solutions

O. Klvač: Operando SEM Workflow for Characterization of Li-ion Batteries

J. Kramář: Cathode Particle Contact Loss Analysis Using SPM-in-SEM

V. Niedzicki: LiTDI-PC-Based Electrolytes for a Wider Li-Ion Batteries Operation Temperature Range

K. Pershina: The reasons capacity loss in Li-ion battery with anatase \ rutile anode under the cycling

Y. Polishchuk: Reserve Lithium Power Sources with Enhanced Specific Energy Based on Innovative $\text{MnO}_2 + \text{MoO}_3$ Cathodes

E. Sedláčková: Investigation of Electrical and Acoustic Impedance With Volumetric Deformation of a Li-ion Cell Under Varying State of Charge

Y. Shmatok: Effect of Ni and La Dual Doping on Electrochemical Characteristics of LiMn_2O_4 in Lithium-Ion Systems

Y. Shmatok: Single Cation Doped $\text{LiM}_{x-1}\text{Mn}_2\text{O}_4$ as Cathode Materials for Lithium-Ion Batteries

P. Souček: Feasibility study of magnetron sputtering prepared high entropy oxide thin films as anodes for lithium and sodium ion batteries

M. Šedina: Evaluating the Response of Various Li-ion Chemistries to Nail Penetration

D. Trochta: Multiscale Structural Evolution in Lithium-ion Batteries Investigated by Operando Scanning Electron Microscopy

Supercapacitors

B. Mladenova: Enhanced Natural Clay Materials for Supercapacitor Energy Technologies

L. Soserov: Electrochemically Deposited Nickel-molybdenum Layers on Nickel Substrates for hybrid supercapacitors

Fuel Cells

D. Budač: The Effect of Electrolyte Structure on the ORR and OER Kinetics in Solid Oxide Cells

M. Danilov: Synthesis the Non-agglomerated Unzipped Multi-walled Carbon Nanotubes as Electrode Materials for fuel cells

J. Žitka: Homogeneous polymer membrane electrolytes for electrolyzers, hydrogen fuel cells and solid state batteries

Aqueous Batteries

N. Globa: Effect of Tetraglyme on Electrochemical Characteristics of LiMn_2O_4 -AC System in Aqueous Electrolyte Li_2SO_4 - H_2O -TG

P. Křivík: Temperature Changes During Repeated Cooling of a Lead-Acid Battery

J. Kršek: Microemulsion redox flow batteries for cheap stationary energy storage

New Systems of Batteries

T. Finsterle: Suitability of a 44-Cell Lithium-Sodium 18650 Pack as a Cold-Start Alternative to a Conventional 12V/15Ah Lead Acid Starter

J. Kasper: Low-Temperature Discharging Performance Comparison of Sodium-Ion and Lithium-Ion Cylindrical Batteries

V. Knap: Low-Temperature Discharge Performance of Cylindrical Sodium-Ion vs. Lithium-Ion Batteries

S. Narayanan: Evaluation of Cycling Performance and Degradation Mechanisms in Commercial Sodium-ion Batteries

A. Šimek: Hard Carbon-Tin Composite as High-Capacity Anodes for Sodium-ion Batteries

Photovoltaics

S. V. Chivikov: Photoelectrochemical Cell with the CdSe Photoanode

J. Vaněk: FT-IR and GC-MS analysis of the chemical recycling products of the PV module

Corrosion, Applications and Simulations

M. Fridrich: Environmental Impacts of Alternative Fuels in Public Transportation

N. Klusoňová: Impact of Particle Size Distribution on the Behavior of Lithium-ion Batteries Under Dynamic Operation

M. Sedlařík: Comprehensive digital twin for stationary battery energy storage

L. Trnková: Advanced Application of Elimination Voltammetry with Linear Scan in Electroanalysis and Electrotechnology

P. Vyroubal: Reduced Modeling of Li-Ion Battery Thermal Abuse

NOTES

