

The 17th International Conference
on Advanced Batteries, Accumulators and Fuel Cells

Program of Lectures and Posters

Organised by Brno University of Technology and co-sponsored by

The International Society of Electrochemistry



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Sunday, August 28th

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

Monday, August 29th

8:00 **Registration**

10:00 **Opening of ABAF 17th**

Prof. Ing. Jarmila Dědková, CSc.

Dean of Faculty of Electrical Engineering and Communication

Prof. Ing. Jiří Vondrák, DrSc.

Organization Committee

Ass. Prof. Ing. Marie Sedlaříková, CSc.

Organization Committee

10:30 *International Society of Electrochemistry*

A Look at the Present with Our Vision for the Future

10:40 *M. Doležal*

Information about Program SoMoPro III

10:50 *P. Barath*

Li- Batteries Summer School

11:00 **Coffee Break**

Lithium Batteries and Related Systems

11:10 – 12:10 *F. Schipper et al.*

Improving Nickel-Rich Layered Cathode Materials via a Doping Strategy:
Zirconium-Doped $\text{LiNi}_{0.6}\text{Co}_{0.2}\text{Mn}_{0.2}\text{O}_2$

S. Hildebrand

Evaluating the Safety of Lithium-ion Battery Materials via Accelerating Rate
Calorimetry

A. Straková Fedorková et al.

Preparation and Characterization of S-LFP-MWCNTs Cathode Composites

12:10 **Time for Lunch**

- 13:00 – 14:10 *T. Kazda et. al.*
Influence of the Annealing Temperature to the Properties of High Voltage Spinel Cathode
- J. Libich et. al.*
Rate Capability of Graphite Negative Electrode in Lithium-Ion cell

Supercapacitors

- K. Wasiński et. al.*
Sodium-ion Hybrid Capacitor Operating in Organic Electrolyte
- L. Kolanowski et. al.*
Modification of Carbon Material by Plasma Treatment and Its Application in Energy Storage
- 14:10 **Coffee Break**
- 14:20 – 15:20 *G. Lota et. al.*
Polysulphides Reversible Faradaic Reactions as Interesting Source of Pseudocapacitance
- D. Peziak-Kowalska et. al.*
Oxidized Activated Carbons as Electrode Materials in Supercapacitor Application

Electrolytes for Aprotic Batteries and Accumulators

- J. Vondrák et al.*
Ionic Liquids in Electrochemical Power Sources
- J. Máca et al.*
Ionic Liquids as Electrolytes
- 15:20 **Coffee Break**
- 15:30 – 16:10 *L. Hromadska*
Mutual Influence of Electrolyte Composition and Electrode Density on Specific Capacitance of Activated Carbon-based Supercapacitors
- J. Wojciechowski
The Influence of the Modification of Electrodes on the Electrochemical Capacitor Parameters
- 16:10 **Poster Section**
- 17:15 **Social Evening**

Tuesday, August 30th

The Other Modern Systems for Batteries

9:00 – 10:20

G. Fafilek et al.

Proof of Concept for a CO₂ Sensor in Water

P. Swoboda et al.

Influence of Electrode Preparation Method on Performance of Negative Electrodes with Carbon-metal Alloy Composites

T. Binar et al.

The Use of Nanotechnology at Storage of Transport Vehicles Engines

T. V. Doan et al.

Mechanical and Tribological Behavior of 42CrMo₄ Steel Treated by Plasma Nitriding.

10:20

Coffee Break

Aqueous Systems

10:30 – 11:30

M. Baraniak et. al.

Influence of Ionic Liquids Additives on Lead Acid Battery Corrosion

M. Graś et. al.

PbO₂ as Electrode Material in Hybrid Electrochemical Capacitor

K. Kopczyński et. al.

Influence of Ionic Liquid Additives on Lead-Acid Battery Working Parameters

11:30-11:40

Coffee Break

11:40-12:20

P. Mazúr et. al.

Scale-up of Vanadium Redox Flow Battery for Use in Residential Houses

M. Swierczynski et. al.

The Second Life Ageing of the NMC/C Electric Vehicle Retired Li-ion Batteries in the Stationary Applications

12:20

Time for Lunch

13:20

Poster Section

15:00

EXCURSION



17:30

Evening Meeting

Wednesday, August 31st

Application of Batteries for Electromobility and Industry

9:00 – 10:00

P. Procházka et. al.

Li-ion Battery Deep Discharge Degradation

K. Propp et. al.

Design, Build and Validation of a Low-Cost Programmable Battery Cycler

P. Swoboda et al.

Large Energy Storage Systems for Renewable Power Sources

10:00

Coffee Break

10:10 – 11:10

J. Marušinec

Types of Batteries in Present Electric Cars

J. Kašpárek

Experimental Production of Li-Accumulators In Czechia

J. Martis et. al.

Compact High-efficiency Li-Ion Fast-charger

11:10

Coffee Break

11:20 – 12:00

C. Caironi et. al.

Bio-Logic: General Company Presentation

J. Kravec

12:00 **Time for Lunch**

13:00 **Poster Section**

14:00 – 17:00 **FEEC Laboratories - UETE**



15:00 **City of Brno with guide**



17:00 **Closing Ceremony**

List of Posters

Section: 1. TECHNOLOGY AND APPLICATIONS

R. Cipin, P. Prochazka, M. Toman, J. Martis, D. Cervinka
Automatic Li-ion Battery Measuring Stand

M. Lula, D. Waszak
Safety Testing of Large Energy Storage

T. Reichl, P. Hrzina
Impulse Diagnostic Test of Battery and Load Influence

P. Swoboda, D. Waszak, A. Sierczyńska, P. Bakiera
Large Energy Storage Systems for Renewable Power Sources

M. Toman, R. Cipin, D. Cervinka, P. Vorel, P. Prochazka
Li-ion Battery Charging Efficiency

P. Vorel, D. Cervinka, P. Prochazka, M. Toman, J. Martis
High Efficiency Fast-Chargers for Lead-Acid Batteries

Section: 2. LITHIUM BATTERIES AND RELATED SYSTEMS

O. Čech, T. Kazda, N. Pizurova, P. Čudek, M. Sedlaříková
Synthesis and Electrochemical Characterization of Monoclinic $\text{TiO}_2(\text{B})$ for Li-ion Cells

P. Čudek, T. Kazda, K. Jaššo
Influence of Compaction Pressure on Properties of Electrodes for Li-S Based Electrochemical Power Sources

M. O. Danilov, I. A. Rusetskii, I. A. Slobodyanyuk, G. Ya. Kolbasov
The Electrochemical Method of Synthesis Graphenes Materials for the Power Sources

T. Gottwald, J. Vondrák, M. Sedlaříková
 MoS_2 as a Negative Electrode Material for SIB

M. Juračka, T. Gottwald, M. Sedlaříková, J. Vondrák
Lithium Sulfur Batteries

V. Knap, D.-I. Stroe, T. Zhang, E. Schaltz, R. Teodorescu, K. Propp
Significance of the Capacity Recovery Effect in Pouch Lithium-Sulfur Battery Cells

J. Libich, O. Čech, M. Sedlaříková, J. Vondrák, M. Kundu, J. Máca
Sodium-Titanate as Negative Electrode Material for Sodium-Ion batteries

A.-I. Stroe, M. Swierczynski, D.I. Stroe, R. Teodorescu, S. K. Kær
Pulse Power Capability Estimation of Lithium Titanate Oxide-based Batteries

J. Tichý, T. Kazda, M. Sedlaříková, P. Čudek
High Voltage Materials for Lithium-Ion Accumulators

U. Tocoglu, M. Alaf, H. Akbulut

Carbon Coated Silicon Nanoparticles Embedded MWCNT/Graphene Matrix Anode Material for Li-Ion Batteries

M. Alaf, U. Tocoglu, H. Akbulut

In Situ Synthesis of SnO₂/Graphene Nanocomposite Anode and Its Enhanced Li-ion Battery Performance

P. Vyroubal, T. Kazda, J. Maxa

FEM Model of Lithium Ion Battery Temperature Field

K. Wasiński, D. Waszak, P. Pórolniczak, A. Jagusiewicz, M. Walkowiak, P. Biczal

Single Li-ion Cell Electrical Performance as Important Factor in Design of Stationary Energy Storage System

O. Čech, M. Sedlaříková, T. Kazda, N. Pizurová, P. Čudek

Monoclinic TiO₂(B) for Li-ion Negative Electrodes

Section: 3. SUPERCAPACITORS

L. Soserov, T. Boyadzhieva, V. Koleva, A. Stoyanova, R. Stoyanova

The Capacitive Performance of Ni(OH)₂-Based Nanocomposites for Hybrid Supercapacitors

J. Wojciechowski, G. Lota, K. Szubert

The Influence of the Modification of Electrodes on the Electrochemical Capacitor Parameters

Section: 4. ELECTROLYTES FOR APROTIC BATTERIES

M. Jahn, M. Sedlaříková, J. Vondrák, L. Pařízek

Gel Polymer Electrolytes on Based MMA

V. Barbashov, E. Chayka, E. Nesova

Effect of Mechanical Load on the Ionic Conductivity in Zirconia

Section: 5. PHOTOVOLTAICS

N. Bentahar, H. Mimoun, G. Otmanine

Accumulators of Solar Energy for Telemetry of Hassi R'Mel Field

M. Frk, J. Hylský, D. Strachala

Rheological Properties of Heat Transfer Liquids for Solar Thermal Systems

J. Hylský, D. Strachala, J. Vaněk

Temperature Influence on the PID Affected Photovoltaic Modules Regeneration

K. Jandová, J. Vaněk

Diagnostic of The Solar Power Stations Servicelife Using of Thermovision

D. Strachala, J. Hylský, M. Kadlec, M. Sionová, P. Čudek, J. Vaněk

Degradation of Perovskite Solar Cell Based on CH₃NH₃PbI₃-2Cl₂ Structure

D. Strachala, M. Kadlec, M. Sionová, J. Hylský, M. Weiter, P., Čudek, J. Vaněk

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Section: 6. AQUEOUS SYSTEMS

P. Bakiera, A. Sierczyńska

Prototype of Ni-MH Battery Based on Metal Hydride Negative Electrodes with Metal-Carbon Composites

O. Čech, J. Zimakova, S. Vaculik, L. Chladil, P. Krivik, P. Bača

Composition of Positive Electrodes for Lead-acid Batteries Cured at Different Conditions: XRD Study

L. Chladil, O. Čech

Pulse Deposition of Zinc from Electrolytes with Reduced Zinc Oxide Solubility

P. Krivik

Temperature Changes During Pulse Charging of Lead Acid Battery in a Flooded State

P. Vyroubal, T. Kazda, P. Bača

FEM Model of Discharging of Lead Acid Battery

J. Zimáková, S. Vaculík, D. Fryda, P. Bača

Combined Effect of Fiberglass and TiO₂ in Negative Active Mass of Lead-acid Accumulator

V. Svoboda, P. Mazur, J. Pcedic, J. Dundalek, J. Vrana, J. Kosek

Screening of Quinone Derivatives for Aqueous Redox Flow Battery

Section: 7. OTHER SYSTEMS

J. Maxa, M. Bílek, P. Hlavatá

Comparison of Results Obtained Using Different Turbulence Models in Analysis Differentially Pumped Chamber

M. Bílek, P. Vyroubal, P. Hlavatá

Analysis of the Gas Flow in the Specimen Chamber of the Environmental Scanning Electron Microscope

M. H. Nobahari, A. N. Golikand

Study of Atomic Structure and Composition Characterization of Intermetallic “Pt₃Co” Nanoparticles on MWCNT as Enhancing Electrocatalyst for Methanol Oxidation

J. Sukáč, J. Vondrák, T. Kazda

The Impact of Outer Climatic Conditions to Unexpected Financial Expenses for the Repairs

P. Vyroubal, T. Kazda, R. Bayer

Numerical Simulation of the Nail Test

A. Sikora, K. Adam, M. Varga, H. Rojacz, G. Fafílek

Voltammetric Study of Steel Corrosion at High Temperatures

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