

**The 18th 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



Shmuel De-Leon Energy Ltd.



The Electrochemical Society



Centre for Research and Utilization of Renewable Energy



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and Utilization
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Sunday, September 10th

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

Monday, September 11th

8:00 **Registration**

10:00 **Opening of ABAF 18th**

Prof. Ing. Jarmila Dědková, CSc.
Dean of Faculty of Electrical Engineering and Communication

Prof. Ing. Jiří Vondrák, DrSc.
Organisation Committee

Ass. Prof. Ing. Marie Sedlaříková, CSc.
Organisation Committee

10:30 *International Society of Electrochemistry*
A Look at the Present with Our Vision for the Future

10:40 *The Electrochemical Society*
Information about ECS

10:50 **Coffee Break**

Lithium Batteries and Related Systems

11:00 – 12:00 *E. Shembel et al.*
Effect Nature of Modifying Additive on Electrochemical Characteristics of Electrodes Based on LiMn₂O₄

A. Straková-Fedorková et al.
Electrochemical characterization of S-C-PPy composites as cathodes for Li-S batteries

O. Markevych et al.
Innovative Reserve High Energy Miniature Cylindrical Li-FeS₂ Battery

12:00 **Time for Lunch**

13:00 – 14:00

L. Kavan et al.

Conduction Band Engineering in TiO₂ Relevant to Solar Cells, Solar Fuel and Li-Batteries

M. Zukalová et al.

Nanocrystalline Li₄Ti₅O₁₂ spinel as an anode material for Na-ion batteries

O. Čech et al.

Sodium Hexatitanate And Biphasic Hexa/Tri-Titanate Nanorods For Sodium Ion Insertion

14:00

Coffee Break

14:10 – 15:10

M. M. S. Sanad et al.

New Na-Layered O₃ Compounds for Rechargeable Na-ion Batteries

T. Kazda et al.

Cathode material for Li-Ion batteries

J. Libich et al.

Lithiated Natural Graphite in Lithium-Ion Cell

15:10

Coffee Break

15:20

P. Vanýsek

Domestic Opportunity of Involvement in Energy Research - EERA

J. Vondrák et al.

Lithium Containing Ionic Liquids for Lithium Batteries

16:30

Social Evening – Brno Dam



Tuesday, September 12th

Supercapacitors

9:00 – 10:00

G. Lota et al.

Electrochemical capacitors: recent advances and future prospects.

L. Kolanowski et al.

Modified carbon materials for energy storage

J. Wojciechowski et al.

Corrosion Processes of Current Collectors Utilized in Electrochemical Capacitors

10:00

Coffee Break

10:10 – 11:10

Y. Shmatok et al.

Electrochemical characteristics of activated carbon Norit DLC Supra 30 in electric double layer capacitors with 1M NaClO₄ EC:DMC electrolyte

Fuel Cells

N.B. Dürger et al.

Synthesis of La-Mg-Ni hydrogen storage alloys by electrodeoxidation method

M. Graś et al.

Study of Electrode Materials in a Direct Borohydride Fuel Cell

11:10

Coffee Break

11:20 – 12:00

P. Mazúr et al.

Flow batteries: From inorganic present towards organic future (?)

P. Barath

Metrohm NOVA software dedicated to battery research

12:00

Time for Lunch

13:00 – 14:30

Poster Section

15:00

Excursion – Wine Cellar



Wednesday, September 13st

Pb Accumulators

9:00 – 10:20

M. Baraniak et al.

Influence of bisulphate ILs additives to electrolyte on lead acid battery formation process

K. Koczynski et al.

Lead-acid Battery with Active Mass Modified by Ionic Liquid

A. Gabryelczyk et al.

Ionic Liquids as Corrosion Inhibitors for Lead-Acid Battery

P. Kedzior et al.

The Development of Lead-acid Batteries – Ionic Liquids a Great Chance for New Generation of Batteries

10:20

Coffee Break

Application of Batteries for Electromobility and Industry

10:30 – 11:20

J. Marušinec

Types of Batteries in Present Electric Cars

J. Kašpárek

Experimental Production of Li-Accumulators In Czechia

P. Vorel et al.

LiFePO₄ powered arc welder

11:20

Coffee Break

11:30 – 12:00

B. Polnik

Autonomous system for monitoring lead-acid battery parameters dedicate to use in the mine battery locomotive

P. Janderka

Pragolab, Bio-Logic: New electrochemical and scanning instrumentation from Bio-Logic SAS

12:00

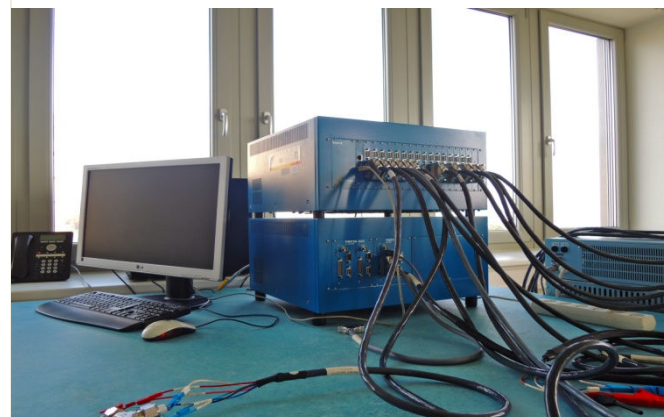
Time for Lunch

13:00 – 14:00

Poster Section

14:00 – 16:00

FEEC Laboratories - UETE



15:00

City of Brno Sightseeing with Guide



17:00

Dinner and Closing Ceremony



List of Posters

Lithium Batteries, Similar Systems and Accessories

R.D. Apostolova

Thin-Layer LiMn_2O_4 , Carbon Nanotubes Composite Electrodes in Lithium Prototype Accumulator

T. Gottwald, J. Vondrák, M. Sedlaříková

Conductivity of Inorganic Perchlorates Dissolved in Aprotic Solvents

M. Jahn, M. Sedlaříková, J. Vondrák

Methacrylate-based Monomers for Gel Polymer Electrolytes and their Properties

K. Jaško, T. Kazda, P. Čudek

Using Natural Sorbent *Luffa cylindrica* as a Conductive Component for Positive Electrodes of Lithium-Sulfur Batteries

K. Karmazinová, K. Jandová

Li-Ion Batteries Recycling – Processes & Technologies

T. Kazda, O. Kaplenko, L. Novák, P. Čudek

Study of the changes on the electrode structure at high temperature load

T. Kazda, M. Sedlaříková, J. Vondrák

Polymers as active materials for Li-Ion accumulators

T. Kazda, J. Tichý, O. Čech, M. Sedlaříková, P. Čudek, T. Binar, J. Švarc

Influence of conditions on the process of high voltage material synthesis

O. V. Kolomojets, O.V. Markevych, E. M. Shembel

Behavior of Modified Lithium Based Anode in the Presence of Sulfur Compounds

J. Máca, M. Sedlaříková, J. Libich and J. Vondrák

Low Flammable Electrolytes

Seyed Saeed Madani, Maciej Jozef Swierczynski, Søren Knudsen Kær

Cooling and Thermal Abuse Modeling of Lithium-ion Batteries Using the Newman, Tiedemann, Gu, and Kim (NTGK) Model

Seyed Saeed Madani, Maciej Jozef Swierczynski, Søren Knudsen Kær

Evolution of Surface Temperature of a 13 Amp Hour Nano Lithium-Titanate Battery Cell Under Fast Charging

I. O. Santos-Mendoza, J. Vazquez-Arenas, I. González, C. O. Castillo-Araiza

A pseudo-homogeneous model to account for the composite effects of a LiFePO_4 cathode

J. Gracheva, M. Jahn, M. Sedlaříková and J. Vondrák

Effect of cross-linking agents and flame retardants on gel polymer electrolyte

P. Vyroubal, T. Kazda

Coupled Field Analysis of LiIon Battery Nail Test

P. Vyroubal, T. Kazda, J. Maxa, J. Vondrák
Coupled Field Analysis of Electric Vehicle

P. Vyroubal, T. Kazda
LiIon Battery Parameters Extraction for Numerical Simulation

T. Reichl, P. Hrzina
Capacity detection of internal short circuit

Aqueous and High Temperature Batteries

Petr Křivík
Impedance study for SoC determination of lead acid battery

Karol Kopciuch, Maciej Kopczyk, Grzegorz Lota, Włodzimierz Majchrzycki, Magdalena Błażejczak, Ewa Jankowska, Sławomir Styczyński, Piotr Fiec
Bipolar plates as an alternative lead-acid battery design

V. I. Barbashov
Ionic conductivity behavior in the vicinity of polymorphic transition in ScSZr ceramics

E. Jankowska, G. Lota, J. Pernak, W. Rzeszutek, W. Majchrzycki, M. Baraniak
Ionic Liquids As Additives To The Positive Mass In Lead-Acid Batteries

S. Vaculík, J. Zimáková, P. Čudek, P. Bača
The Possibilities of Using Grafenoids as an Additive in NAM

J. Zimáková, S. Vaculík, P. Čudek, P. Bača
In-situ Observations Using AFM

J. Smejkal, L. Chladil
Study of Effect of Organic Additives on the Morphology of Zinc Deposit

Photovoltaics

D. Strachala, J. Hylský, J. Vaněk
Influence of Moisture on Perovskite Photovoltaic Cells

K. Jandová, M. Janda
Simulation of Airflow In The Area Of Photovoltaic Power Plants

J. Hylský, D. Strachala, J. Vaněk
Analysis of PID Degraded Photovoltaic Power Plant

J. Vaněk, P. Lepík
Usage of Low Cost Digital Camera for Detecting of Silicon Solar Cell Electroluminescence

D. Strachala, J. Hylský, K. Jandová, J. Vaněk, Š. Cingel
Mechanical Recycling of Photovoltaic Modules

Other technology, applications and simulations

M. Bílek, J. Maxa P. Hlavatá, R. Bayer

Modelling and simulation of a velocity field within supersonic flows in low-pressure areas

K. Lepřtová, J. Maxa, P. Hlavatá, M. Bílek

Design of the shape of the experimental chamber for the analysis of the velocity layout in the differential pumped chamber

M. Błażejczak, S. Styczyński, K. Kopciuch, E. Jankowska, W. Majchrzycki

Impulse charging of Zn electrodes in rechargeable Zn-air cells

V. Hájková, J. Maxa, P. Hlavatá, M. Bílek, P. Vyroubal

Design of the shape of the experimental chamber for the analysis of the pressure layout in the differential pumped chamber

P. Hlavatá, J. Maxa, M. Bílek

Impact of the shape of the differentially pumped chamber on critical flow character

M. Sedlaříková, P. Čudek, J. Vondrák

Pyrolytic Preparation of Novel Iron Alloys for Biodegradable Implants

P. Procházka, I. Pazdera, O. Vitek, P. Huták

Electric Drive Unit for Forwarder Trailer

I. Pazdera, P. Huták, J. Knobloch, T. Lažek, P. Procházka

Design of Battery Powered Wheelbarrow

M. Toman, R. Cipin, P. Vorel

Thermal Calculation of Li-Ion Battery Pack

R. Cipin, M. Toman, J. Knobloch

Estimation of Primary Cell Parameters

R. Bayer, J. Maxa

Increasing Accuracy of Simulations of Gas Flowing into Low-Pressure Areas Using Optical Methods on Shockwaves

J. Mrlík, P. Mazúr, J. Vrána, J. Pociď, J. Dundálek, J. Kosek

Thermal Activation of Graphite Felt Electrode for Vanadium Redox Flow Battery

J. Sukáč, J. Vondrák, T. Kazda

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

T. Binar, M. Sedlaříková, V. Hyánek

The Use of Nanotechnology at Storage of Transport Vehicles Engines

M. A. Antonova, M. V. Ptitsyn

Batteries for uninterruptible power supplies

Notes

