19th ABAF
BRNO 2018
Advanced Batteries, Accumulators and Fuel Cells

BRNO UNIVERSITY OF TECHNOLOGY
FACULTY OF ELECTRICAL ENGINEERING AND COMMUNICATION

The 19th 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

Shmuel De-Leon Energy Ltd.

Centre for Research and Utilization of Renewable Energy

General sponsor

Other sponsors

Sunday, August 26th

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

Monday, August 27th

8:00 **Registration**

10:00 **Opening of ABAF 19th**

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

Col. Assoc. Prof. Ing. Ivo Pikner, Ph.D.
Dean of Faculty of Military Leadeship, University of Defence

Prof. Ing. Jiří Vondrák, DrSc.
Organisation Committee

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

Ing. František Klein
Organisation Committee

10:30 *Assoc. Prof. Miroslav Fojta*
International Society of Electrochemistry
A Look at the Present with Our Vision for the Future

10:40 **Coffee Break**

Lithium Batteries and Related Systems

10:50 – 11:50 *E. Shembel*
Synergistic Effect of Innovating Electrode Technology and Eddy-Current Electromagnetic Impedance for Non-Destructive Testing are Resulting in Increasing Battery Power

E. Legotin
Improved Electrochemical Performance of NMC Cathode Material Produced via Spray-Roasting Route

T. Kazda
Lithium-sulfur batteries and the methods of their stabilization

11:50	**Time for Lunch**
12:50 – 13:50	*M.A. Ansari* A Computational Study on the Effect of Stress Concentrations on Stress-Electrochemistry Interactions in Li-ion Battery Electrode Particle
	O. Markevych Innovating methods production high energy sulfur based electrode for stableand safer Lithium-Sulfur Batteries
	M. Zukalová Layered LiNi1/3Mn1/3Co1/3O2 (NMC) with optimized morphology for Li-ion batteries
13:50	**Coffee Break**
14:00 – 15:00	*Ma Yulin* Enabling Reliable Lithium Metal Batteries by a Bifunctional Anionic Electrolyte Additive
	J. Máca Contribution to chemistry of EMIM.BF4 ionic liquid
	P. Barath Metrohm NOVA software dedicated to battery reserch
15:00 – 16:00	**Poster Section**
16:15	**Brno Walking Tour to Špilberk Castle with Guide** Departure from Hotel Continental 16:15 or **Špilberk Castle Prison Tour** Departure from Hotel Continental 16:30
18:00	**Špilberk Castle Restaurant** Social Evening

Tuesday, August 28th

Supercapacitors

9:00 – 10:00

K. *Lota*
The Activated Carbon From Biopolymers as the Electrode Material for Electrochemical Capacitors

G. Lota
The Influence of Electrolyte on The Performance of Electrochemical Capacitors

L. Kolanowski
Heteroatom-doped Carbon for Energy Storage

10:00 **Coffee Break**

Fuel Cells

10:10 – 11:30

*L. Kolanowsk*i
Carbon-supported AB_5-type Hydrogen Storage Alloy for DBFC Application

H. Al-Fetlawi
Performance Enhancement of a Single-Chamber Membraneless Microbial Fuel Cell

I. Chikunova
Macroporous SnO_2 As A Stable Cathode Catalyst Support For PEMFCs

M. Paidar
Development of PEM FC based auxiliary power unit

11:30 **Coffee Break**

New Systems of Batteries

11:40 – 13:00

I. Maksyuta
Electrodes Based on Magnesium Alloys for Innovative Magnesium Batteries with Non-Aqueous Electrolytes

P. Mazúr
High-performance long-lasting vanadium redox flow batteries for stationary energy storage applications

E. Alexeeva
Effect of Structure of Polymeric Nickel Complexes with Salen-Type Ligands on The Stability in Solutions of Water-Containing Electrolytes and The Charge Transfer

F. Bohrn
Mg – substituted Lithium Vanadium Phosphate (LVP)

13:00 **Time for Lunch**

13:45 **Náměšť nad Oslavou Castle + Saint Jacobs Brewery Hluboké**
Excursion and Dinner
Departure from Hotel Continental 13:45

21:00 **Lightning Show**
Brno Technical University Venue

Wednesday, August 29th

Solar Cells

9:00 – 9:20 *E. Shembel*
Nanostructured Transparent Polymer Provides Innovation Design for Solar Cells. Increasing Energy and Improving Performance.

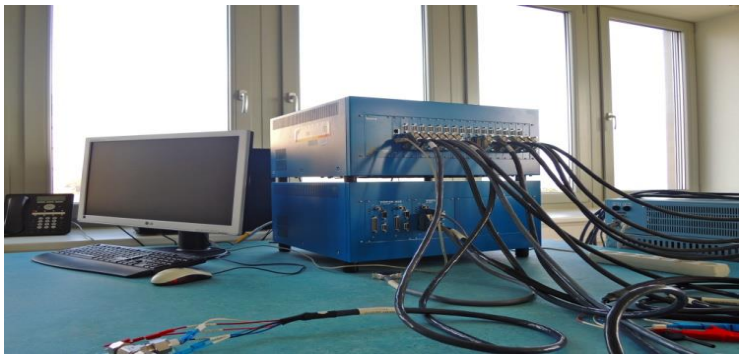
Application of Batteries for Electromobility and Industry

9:20 – 10:20 *B. Polnik*
An innovative power supply system dedicate for Roadheading mining machines

J. Marušinec
Types of Batteries in Present Electric Cars

J. Kašpárek
Experimental Production of Li-Accumulators in Czechia

10:20	**Coffee Break**
10:30 – 11:10	*J. Vejbor* EVC Group: Turn-Key Industry Lithium Traction Battery Systems From Hulin *P. Janderka* Pragolab, Bio-Logic: New electrochemical and scanning instrumentation from Bio-Logic SAS
11:10 – 12:10	**Poster Section**
12:10	**Time for Lunch**
13:10 – 16:00	**FEEC University Laboratories - UETE** Departure from the Conference Premises



17:00	**Restaurant U toulavého kocoura + Brno Viewpoint** Dinner and Closing Ceremony Departure from Hotel Continental 16:30

List of Posters

Lithium Batteries and Related Systems

K. Banov: NMC cathode material for large scale application in EV

K. Gavalierová: Cathode Material Based on S/C Composite for Li-S Batteries

M. Jahn: Gel Polymer Electrolytes Modified Nanoparticles and Polymerized in Magnetic and Electric Fields

K. Jaššo: Carrageenan as the Binder for the Lithium-Sulfur Batteries

H. Kim: Structure Instability of Cathode Active Materials in Lithium Ion Battery Induced by Lattice Distortion: Phase Field Analysis

S. Madani: A Comprehensive study of Working Temperature and Entropy Impacts on a Lithium-Ion Battery Thermal Behaviour by Employing Isothermal Calorimeter

S. Madani: Investigation of Reversible and Irreversible Heat Sources and Entropic Coefficient in a Lithium-Ion Battery by Employing Isothermal Calorimeter

S. Madani: Investigation of the Effect of State of Charge, C-rates and on the Heat Generation, Internal Resistance and Efficiency of a Lithium-ion Battery by Using Isothermal Calorimeter

S. Madani: A Review of Different Electric Equivalent Circuit Models and Parameter Identification of Lithium-ion Batteries

A.V. Potapenko: Improving high-rate properties of electrode materials: prevention of aggregation and surface modification

F.A. Susai: Recent Advances and Challenges on Ni-Rich Cathode Materials for Lithium-Ion Batteries

I. Veselkova: Flame Retardants as Solvent in Gel Polymer Electrolytes

P. Vorel: Durability of a Li-ion battery pack

S. Yi: Ab-initio Calculation of New Poly-oxyanion Cathode Materials of Li-ion Battery

Aqueous Batteries

P. Křivík: In situ measurement of PEIS of lead acid battery cell

G. Lota: The Lead - Acid Battery Modified By Ionic Liquid

New Types of Batteries

R. Apostolova: Electrochemical Properties Electrodes Based on Mn_3O_4, Mn_2O_3 in Non-Aqueous Electrolyte with Magnesium or Lithium Perchlorate

T Hwang: First -Principles Study On Mechanism Of Graphite Oxide As Anode material in Na-Ion Battery System

J. Libich: Performance of Graphite Negative Electrode In Lithium-Ion Battery Depending Upon The Electrode Thickness

O. Markevych: Electrochemical properties of magnesium electrodes in in lithium non-aqueous electrolytes. Perspective of high-energy hybrid magnesium batteries

V. Rojas: Chemometric approach to study the influence of synthesis parameters on the structural and electrical responses of metal polycyanometalates (MPCMs) for optimizing their use as cathodes in metal(M)-ion batteries (M = Li^+, K^+, Na^+).

Photovoltaics

M. Danilov: Accumulation of "Solar" Hydrogen in the Photoelectrochemical System Based on CdSe Photoanode and MH Cathode

T. Dvořák: Changes in Properties of Perovskite Solar Cells During Their Lifetime

J. Hylský: Protection Against PID Degradation at Photovoltaic Cell Level
Possibilities of Regeneration of a PID Degraded PV Cell

K. Jandová: Simulation Of Effects Of Wind In The Installation PV Power Plants

D. Strachala: Changes of the Active Perovskite Solar Cell Layer Caused By External Influences Perovskite Solar Cells with Increased Resistance to Moisture

Other Technology, Applications and Simulations

R. Bayer: Static pressure measurement within a flow measurement and mapping chambre

M. Bílek: Analysis of the Impact of the Baffle Placement in the Supersonic Flow in the Differentially Pumped Chamber

R. Cipín: High-Frequency Model of Alkaline Battery in Form of Transfer Function

O. Čech: Graphene Oxide and Reduced Graphene Oxide for Power Sources Characterized by XRD and SEM

O. Čech: Fibrous Materials Prepared by Centrifugal Force Spinning

D. Dobrocký: Change of surface texture parameters of grinded surfaces after application of hard and abrasion resistant layers

P. Faltejsek: Corrosion Resistance of High Temperature Plasma Nitrided X12CrMoWVNbN10-1-1 martensitic stainless steel

P. Hlavatá: Mathematical- physics evaluation of the flow in the experimental chamber

P. Hlavatá: Design of the conic static probe tip of the Pitot's tube in experimental chamber

J. Martyš: Battery-powered Soldering Gun

F. Matloub: Separation of Chromium from Tanning Wastewater by Electrochemical Method

J. Maxa: Comparative analysis of ideal and real gas in pumping of the experimental chamber

Z. Pokorný: The influence of alloying elements on surface hardness of ferritic nitrocarburizing layers of ball screws

P. Procházka: Battery powered mini-excavator

T. Reichl: Study of the Current Value Influence on the Internal Resistance Value

M. Sedlaříková: Preparation and corrosion of biodegradable iron based porous materials

M. Sedlaříková: Chemical corrosion of porous iron alloys prepared pyrolytically

M. Toman: Thermal Model of Cylindrical Battery Cell

J. Vaněk: Electrical conductivitie of reduced graphene oxide thin-film layers

P. Vyroubal: FEA Methods for Lithium Ion Battery Simulation

P. Vyroubal: FEM Analysis of LiIon Battery Nail Test

P. Vyroubal: Thermal Simulation of Thermo-photovoltaic Emitter

Notes