This meeting will be co-sponsored by The Electrochemical Society.

13th ABAF
BRNO 2012
Advanced Batteries, Accumulators and Fuel Cells

INTERNATIONAL CONFERENCE
August 26th - August 30th 2012

SCIENTIFIC AND SOCIAL PROGRAM

Organised by:

Department of Electrical and Electronic Technology,
Faculty of Electrical Engineering and Communication,
Brno University of Technology

Chairman:
 Jiří Vondrák

Vice-chairman
Marie Sedláříková
Sunday, August 26th

17:00 – 20:00  
Registration – get together party

Monday, August 27th

8:00  
Registration

9:30  
Opening of ABAF – 13th  
Prof. Ing. Jaroslava 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  
Ing. Miloš Křepelka  
The Ministry of the Environment  
Ing. Martin Voříšek  
The Ministry of Industry and Trade of the Czech Republic

10:00  
Prof. Petr Vanýsek  
The electrochemical society

10:15  
E. Szász  
WEB OF SCIENCE AND RESEARCHER ID – MAKING YOUR WORK VISIBLE AND ACCESSIBLE

10:30  
B. Postránecká  
A CHALLENGE FOR TALENTED SCIENTISTS

10:40  
Coffee-break

Inorganic Materials for Power Sources

10:50  
Key lecture  
M. Belén, M. Concha, M. Chatenet, F. H. B. Lima, E. A. Ticianelli  
STUDY OF NH₃BH₃ OXIDATION REACTION ON GOLD ELECTRODES BY IN SITU FOURIER TRANSFORM INFRARED SPECTROSCOPY AND DIFFERENTIAL ELECTROCHEMICAL MASS SPECTROMETRY

11:20  
P. Y. Olu, M. Rouhet, M. Chatenet, A. Bonnefont, E. Savinova  
STUDY OF THE BH₄⁻ ELECTROOXIDATION MECHANISM ON PT CATALYST USING ROTATINGRING-DISK ELECTRODE (RRDE).
11:40
M. O. Danilov, Ya. G. Kolbasov, A.I. Rusetskii, A.I. Slobodyanyuk
ELECTROCATALYTIC PROPERTIES OF REDUCED GRAPHENE OXIDE IN OXYGEN ELECTRODE

12:00
Time for lunch

Fuel cells and methods

13:00
Key lecture
T. Ōkada, T. Takahashi, Ch. Ono, M. Kyotani, S. Kimura, S. Matsushita and K. Akagi
LOW-COST FUEL CELL MATERIALS MADE FROM NEW SOURCES

13:30
P. Vanýsek
ELECTROCHEMICAL IMPEDANCE SPECTROSCOPY – JUST ONE OF MANY TOOLS TO STUDY BATTERIES AND POWER SOURCES

13:50
M. Alrahmani, R. Chen, S. Ibrahim
A NUMERICAL STUDY ON THE EFFECT OF GAS CHANNEL WETTABILITY IN PEM FUEL CELLS: STRAIGHT CHANNEL

14:10
S. Cruz-Manzo, R. Chen
ANALYSIS OF THE PERFORMANCE OF A POLYMER ELECTROLYTE FUEL CELL STACK USING SIMULTANEOUS ELECTROCHEMICAL IMPEDANCE SPECTROSCOPY MEASUREMENTS

14:30
Coffee-break

14:40
F. Jinuntuya, R. Chen, H. Ostadi, K. Jiang, Y. Gao, X. Zhang
THE IMPACTS OF IMAGE RESOLUTION ON PERMEABILITY SIMULATION OF GAS DIFFUSION LAYER USING LATTICE BOLTZMANN METHOD

15:00
W. Xu, D. Danilov, L. Gao, J. F. M. Oudenhoven, V. Pop and P. H. L. Notten
ENZYMATIC BIOFUEL CELL FOR IMPLANTABLE DEVICES

15:20
N. Mc Carthy, A. El-Karouf, R. Chen, W. Bujalski
THE IMPACT OF CATHODE GAS DIFFUSION LAYER STRUCTURE ON FUEL CELL PERFORMANCE

Special simulations methods

15:40
P. Vyroubal, J. Maxa, P. Bača, J. Tichý
SIMULATION AND MATHEMATICAL DESCRIPTION OF CHARGING AND DISCHARGING OF THE LEAD ACID ACCUMULATOR

16:00 – 17:00
Poster session (Fuel cells, Lithium-ions accumulators, Lead-acid accumulators)

17:00
Social evening
Tuesday, August 28th

Lithium-ions accumulators

9:00  Key lecture
   DEVELOPMENT OF LITHIUM-ION BATTERY PROTOTYPES FOR ELECTRIC CARS

   STUDY OF LITHIUM – RICH LAYERED COMPOUNDS Li(MnNiCo)₂ AS POSITIVE ELECTRODES IN LITHIUM CELLS

   ELECTROCHEMICAL AND XPS STUDIES OF PPY/PEG LIFEP0₄ CATHODE MATERIAL

10:10 Coffee-break

10:20 Ferrara G., Arbizzani C., Damen L., Guidotti M., Vergottini F. G., Inguanta R., Piazza S., Sunseri C., Mastragostino M.
   SN-CO NANOWIRES: HIGH-PERFORMING ELECTRODES AS ANODES FOR LITHIUM-ION BATTERIES

10:40 M. Sedlaříková, J. Vondrák, H. Mattheislova, M. Musil
   SAFETY ENHANCING OF LITHIUM-ION ACCUMULATORS

11:00 Time for lunch

12:00 – 13:30 Poster session (Alkaline accumulators, Special batteries and materials, Photovoltaics)

14:30 Excursion
   TECHNICAL MUSEUM IN BRNO, WINE CELLAR
Workshop organized by CLAIO Poznan (Poland) and Institute of non-ferrous metals, Gliwice (Poland) and co-sponsored by the project „Advanced technologies for production of functional materials for energy transfer, conversion and storage“.

Supercapacitors

9:00  
K. Lota, G. Lota, A. Sierczynska, M. Kopczyk, I. Acznik  
ASYMMETRIC CAPACITORS BASED ON CONDUCTING POLYMERS AND METAL OXIDE/CARBON COMPOSITES AS ELECTRODES

Alcaline accumulators

9:20  
A. Sierczynska, P. Swoboda, K. Lota, G. Lota, M. Kopczyk  
INVESTIGATION OF ELECTROCHEMICAL PROPERTIES OF AB2/AB5- TYPE HYDROGEN STORAGE ALLOYS AS ANODIC MATERIALS FOR HIGH ENERGY Ni-MH CELLS

Special batteries

9:40  
S. Styczynski, W. Missol, A. Rydzyńska, D. Szal, M. Kopczyk  
PERFORMANCE OF THERMAL CELLS, BASED ON Mg-PbSO₄ ELECTROCHEMICAL SYSTEM, MADE FROM POWDER MATERIAL

Inorganic Materials for Power Sources

10:00  
G. Lota, A. Sierczynska, K. Lota  
AB5-TYPE HYDROGEN STORAGE ALLOY MODIFIED WITH CARBON USED AS ANODIC MATERIALS IN BOROHYDRIDE FUEL CELL

10:20  
Coffe-break

Lithium-ions accumulators

10:30  
M. Walkowiak, M. Osińska-Broniarz, M. Pokora, P. Półrolniczak, and M. Kopczyk  
STRUCTURAL AND ELECTROCHEMICAL PROPERTIES OF COMPOSITE GEL ELECTROLYTES WITH OXIDE NANOFILLERS
10:50  
P. Półrolniczak, M. Walkowiak, A. Wrona, A. Martyła, M. Kopczyk  
SYNTHESIS AND ELECTROCHEMICAL LITHIUM INSERTION INTO  
SKUTTERUDITE-TYPE MATERIALS

11:10 – 12:00  
Poster session (Workshop organized by CLAIO Poznan)

12:00  
Time for lunch

Electric Vehicles and the other Applications  
( ABAF program continuation )

12:50  
Jiří Bendl, Miloš Křepelka,  
MINISTRY OF THE ENVIRONMENT OF THE CZECH REPUBLIC:  
CLEAN MOBILITY

13:10  
B. Klima, P. Hutak, R. Cipín, J. Knobloch, Z. Nouman and  
J. Vondrus  
BATTERY MONITORING SYSTEM FOR THE AIRPLANE VUT  
051 RAY

13:30  
M. Morte, A. Doucek, J. Kyncl  
THE HYDROGEN BUS AS A MATHEMATICAL MODEL IN  
MATLAB© – COMPARISON WITH ITS ACTUAL OPERATION

13:50  
Coffe-break

14:00  
D. Červinka, P. Vorel  
HIGH-POWER CHARGER FOR SUPER-EL ELECTRIC PASSENGER  
CAR

14:20  
J. Kašpárek  
PRODUCTION OF BATTERIES LiFePO₄ FOR ELECTRIC VEHICLES  
AND ACCUMULATION SYSTEMS

14:40  
J. Marušinec  
RESTART ELECTRIC VEHICLES IN THE YEAR 2012

15:30  
Excursion to hydroelectric power plant and social evening
List of posters

1. **Fuel cells**
   - *G. Ya. Akimov, Yu. A. Komysa*
     Cold Isostatic Pressing Effect on Microstructure and Electrical Characteristics of ScCeSZ Ceramics
   - *M. Kunovjánek, J. Vondrák*
     PVA/KOH Membrane for Electrolysis with High Conductivity
   - *P. Prochazka, I. Pazdera, K. Bencalik*
     Usage of the Fuel Cell-Powered Electric Drive in Aviation
     Mechanisms of Ionic Conduction in PVA Based Nanocomposites
   - *J. Subarda, M. Kunovjanek, M. Musil*
     PVA Membranes for the PEM Fuel Cells

2. **Lithium-ion accumulators**
   - *R. Apostolova, O. Kolomoyets, E. Shembel*
     Influence of the Electrolyte Agitation at the Synthesis of the Electrolytic Nickel Sulfides on Their Electrochemical Characteristics in Lithium Accumulator Model
   - *O. Cech, P. Kovar, M. Sedlarikova, J. Vondrák*
     Brookite TiO2 Nanorods for Lithium-Ion Anodes
   - *M. Frk, J. Máca, Z. Rozsivalová*
     Dynamic Viscosity of Solvents for Electrolytes of Lithium-Ion Accumulators
   - *N. I. Globa, Yu. V. Shmatok, V. D. Prisyazhyi*
     Electrochemical Characteristics of Li,MnO2 Synthesized by Microwave Method
   - *N. I. Globa, V. D. Prisyazhyi, O. B. Pushyk, Al. V. Potapenko*
     Electrolytes for Li-Ion Batteries Operating in Wide Temperature Range
   - *O. Kaválek, J. Vondrák*
     Electrochemical Deposition of Tin and Silicon Studied by EQCM
   - *M. Sedlaříková, T. Kazda, J. Vondrák*
     Effect of Potassium on the Stability of the Structure of LICOO2
   - *M. Sedlaříková, J. Vondrák, J. Libich, O. Dvořák, H. Matheislová*
     Enhance Capacity and Safety of Lithium-Ion Accumulators
J. Máca, J. Vondrák, M. Sedlaříková
USE OF DIMETHYL SULFONE IN APROTIC ELECTROLYTES

A. Martyła, A. Walkowiak, A. Wrona, K. Bilewska, P. Półrolniczak
STRUCTURAL ANALYSIS OF CoSb$_3$ BASED POWDERS OBTAINED BY DIFFERENT SYNTHETIC ROUTES

M. Osińska-Broniarz, M. Walkowiak, T. Jesionowski
EFFECT OF FUNCTIONALISED SILSESQUIOXANES ON LITHIUM CATION TRANSPORT IN PEO BASED POLYMER ELECTROLYTES

Z. Štíchová, J. Máca, M. Sedlaříková, J. Vondrák
ELECTROCHEMISTRY OF SULFOLANE AT LOW TEMPERATURES

P. Vyrubal, J. Maxa, T. Kazda, J. Vondrák
MODELING AND NUMERICAL SIMULATION OF LITHIUM ION BATTERY

J. Máca, J. Vondrák, M. Sedlaříková, M. Zatloukal, K. Bartušek
PHASE DIAGRAM FOR MIXTURES OF SULFOLANE – DIMETHYLCARBONATE FOR USING IN ELECTROLYTES FOR LITHIUM – ION BATTERIES

3. Lead-acid accumulators
P. Abraham, P. Bača, S. Vaculík
ACTIVE MASS AND COLLECTOR CORROSION RESISTIVITY AND IMPEDANCE CHANGES OF PULSE CHARGED LEAD-ACID ACCUMULATOR

INFLUENCE OF VARIOUS AMOUNTS OF TITANIUM DIOXIDE IN NEGATIVE PLATE TO IMPEDANCE PROPERTIES OF LEAD-ACID ACCUMULATOR

P. Křivík
HEAT CHANGES IN THE LEAD ACID BATTERY CELL

P. Křivík, P. Bača, P. Tošer
CONDUCTIVE CERAMIC AS AN ADDITIVE OF NEGATIVE ACTIVE MASS OF LEAD ACID BATTERY

J. Wesolowski, M. Lula
INFLUENCE OF CHEMICAL COMPOSITION OF LEAD ALLOYS USED IN LEAD-ACID BATTERIES ON THEIR ELECTRICAL PERFORMANCE

K. Tonar, P. Tošer, P. Bača, K. Micka
DIFFERENT ELECTROLYTE ADDITIVES FOR LEAD ACID BATTERIES IN ELECTRIC VEHICLE APPLICATIONS

4. Alkaline accumulators
K. Becker, M. Pokora, K. Leszczyńska-Sejda, Z. Szołomicki, A. Wrona, M. Osadnik
CONCEPT FOR RECOVERY OF VALUABLE COMPONENTS FROM BLACK MASS, SEPARATED FROM Ni-MH BATTERY SCRAP

O. Kaválek, L. Chladil, J. Máca
EFFECT OF INHIBITORS ON Zn-DENDRITE FORMATION
A. Sierczynska, M. Kopczyk, M. Woch, P. Swoboda, K. Lota, G. Lota
THE EFFECT OF NICKEL CONTENT IN NEGATIVE MASS ON ELECTRODE
CAPABILITY IN Ni-MH SYSTEM

T. Máca, L. Nezgoda, J. Vondrák, M. Sedlaříková
EFFECT OF COBALT ADDITION ON STRUCTURE AND ELECTROCHEMICAL
BEHAVIOUR OF NICKEL HYDROXIDE SYNTHESIZED BY CHEMICAL
PRECIPITATION METHOD UNDER DIFFERENT CONDITIONS

M. Musil, M. Kunovjánek, O. Čech
MEMBRANES FOR ALKALINE ACCUMULATORS

D. Pléha, P. Dvořák, M. Kunovjánek, M. Musil, O. Čech
SEPARATORS FOR ALKALINE ACCUMULATORS

A. Sierczynska, A. Wrona, K. Lota, G. Lota, P. Swoboda, M. Kopczyk
CARBON MODIFICATIONS OF AB5-TYPE HYDROGEN STORAGE ALLOY USED
AS ANODE MATERIALS IN Ni-MH CELLS

J. Vrbický, J. Vondrák, M. Sedlaříková
SURFACTANT ELECTROLYTE ADITIVES EFFECT ON ALPHA NICKEL
HYDROXIDE

5. Special batteries and materials
V.I. Barbashov, E.V. Nesova
ANISOTROPY IN CONDUCTIVITY OF SCANDIA-STABILIZED ZIRCONIA

V. Barbashov, E. Nesova, N. Pismenova
LAPLACE’S PRESSURE INDUCED RHOMBOHEDRAL PHASE IN THE SCANDIA-
STABILIZED ZIRCONIA CERAMICS

D. Červinka, P. Vorel
CONNECTING ISSUES OF THE FAST-CHARGERS FOR TRACTION BATTERY TO
DISTRIBUTION NETWORK

J. Kadlec, Z. Joska, J. Kadlec jr.
STUDY OF BIOCOMPATIBLE Zr AND ZrN/DLC COATING DEPOSITED ON
MEDICAL TOOLS

T. Binar, J. Kadlec, M. Rejzek, M. Vlkovský
EFFECT OF ENVIRONMENTAL TEMPERATURE ON THE BRITTLE-FRACTURE
CHARACTERISTICS UNDER DYNAMIC LOADING AND ASSESSMENT OF
DEFORMATION ON LOW-ALLOY STEEL DEVICES USED IN CONTAINERIZATION

K. Lota, G. Lota, A. Sierczynska
CARBON NANOTUBES AS A SUPPORT OF ELECTRODE ACTIVE MATERIAL FOR
ELECTROCHEMICAL CAPACITORS

J. Máca, P. Abraham, P. Bača
APPLICATION OF WIND TURBINE TO TEACHING
I. Jakubis, M. Sedlaříková, J. Vondrák
ELECTRODEPOSITED THIN LAYERS OF TiO₂

6. **Photovoltaics**
L. Šimonová, J. Vaněk, S. Demchikhin
RECYCLING OF PHOTOVOLTAIC CELLS WITH THE POSSIBILITY OF RE-USE SOME COMPONENTS

P. Tošer, P. Bača, J. Neoral
THE WAYS HOW TO MEASURE THE CHARACTERISTICS OF THE SOLAR CELL

J. Vanek, J. Strnadel
LONG TIME MONITORING OF HEAT DISTRIBUTION IN PHOTOVOLTAIC MODULE BY THE THERMOVISION

J. Vanek, T. Kaderka
V-I CHARACTERISTIC MEASUREMENT OF SOLAR CELL

A. Vesely, J. Vanek, R. Stojan
CONCENTRATOR PHOTOVOLTAIC SYSTEMS

P. Vyroubal, J. Maxa, J. Vaněk, M. Solčanský
DESIGN AND OPTIMALIZATION OF CONCENTRATOR SOLAR PANELS COOLING SYSTEM USING COMPUTER SIMULATION
For more information please contact us:

Doc. Ing. Marie Sedlaříková, CSc.
Department of Electrical and Electronic Technology
Brno University of Technology
phone: +420 5 4114 6143
e-mail address: sedlara@feec.vutbr.cz

Prof. Ing. Jiří Vondrák, DrSc.
Department of Electrical and Electronic Technology
Brno University of Technology
phone: +420 607 285 434
e-mail address: vondrakj@feec.vutbr.cz
Partners:

Media partners: