LABAT'96

03-06 June 1996, Varna, Bulgaria

Presented papers

POSITIVE PLATE

Positive plate additives

P.Moseley, ILZRO, Research Triangle Park, NC, USA

Structural phenomena in the positive lead-acid battery plates for EV batteries

G.Papazov, D.Pavlov, Central Laboratory of Electrochemical Power Sources, Bulgarian Academy of Sciences, Sofia, Bulgaria

Structural and morphological aspects of the grid/PAM interface in lead-acid batteries

C.Brissaud, G.Reumont, J.Foct, Laboratoire de Metallurgie Physique, CNRS URA 234, Universite de Lille I, Villeneuve d'Ascq Cedex, France
J.P.Smaha, OLDHAM France S.A., Service Technique, Arras Cedex, France

Analysis of the positive plate conductance during cycling

M.Calabek, P.Baca, V.Smarda, Technical University of Brno, Brno, Czech Republic
K.Micka, J.Heyrovsky Institute of Physical Chemistry, Prague, Czech Republic

The kinetic mechanism of the PbO_2 discharge of the lead-acid positive plate

C.V.D'Alkaine, M.C.Lopes, Group of Electrochemistry and Polymers, DQ-UFSCar, Sao Carlos (SP), Brazil

On the discharge mechanism of lead-acid positive electrode

J.D.Milewski, Central Laboratory of Batteries and Cells, Poznan, Poland

Role of hydration water in the process of the reduction of PbO_2 in lead-acid cells

R.Fitas, L.Zerroual, N.Chelali, B.Djellouli, Laboratoire d'Energetique et d'Electrochimie du solide, Universite de Setif, Setif, Algeria

Capacity decay of positive plate on deep discharge cycling of lead-acid battery

M.Dimitrov, Central Laboratory of Electrochemical Power Sources, Bulgarian Academy of Sciences, Sofia, Bulgaria

Influence of $CaSO_4$ on the properties of the positive lead-acid battery plates

T.Rogachev, D.Pavlov, Central Laboratory of Electrochemical Power Sources, Bulgarian Academy of Sciences, Sofia, Bulgaria

Monotubular positive plate for lead-acid cell

G.Kolikova, V.Egorov, J.Kamenev, Accumulator Institute "Istochnik", St. Petersburg, Russia

NEGATIVE PLATE

Reaction model development for the $Pb/PbSO_4$ system

J.R.Vilche, Instituto de Investigaciones Fisicoquimicas Teoricas y Aplicadas (UNIFTA), Fac. de Ciencias Exactas, Universidad de La Plata, La Plata, Argentina

Negative plate on plastic base for lead-acid cell

V.Bolotovsky, V.Egorov, Accumulator Institute "Istochnik", St. Petersburg, Russia

The negative plate of the lead-acid battery. general analysis of energetic and utilization coefficients

C.D'Alkaine, A.Carubelli, Group of Electrochemistry and Polymers, Sao Carlos (SP), Brazil

A study of passivation mechanism of negative plate in lead-acid batteries

Y.Guo, M.Wu, S.Hua, Department of Chemistry, Shandong University, Jinan, China

Influence of the $BaSO_4$ content in the negative SLI battery plates on their performance

S.Ruevski, D.Pavlov, Central Laboratory of Electrochemical Power Sources, Bulgarian Academy of Sciences, Sofia, Bulgaria

Protective coating of copper current collectors for lead-acid cells

G.Kolikova, M.Lushina, V.Bolotovsky, Accumulator Institute "Istochnik", St. Petersburg, Russia

LEAD ELECTRODES, OXYGEN ELECTRODE

Application study of pourbaix diagram of Pb-H_2SO_4-H_2O solution

H.Chen, Z.Huang, Research Institute of Guangzhou Storage Battery Enterprises Co., Ltd., Guangzhou, China
Z.Wang, S.Duan, University of Science and Technology Beijing, Beijing, China

Analysis by Meossbauer spectrometry and TEM of Sn in PbO

A.El Ghachcham Amrani, P.Steyer, J.Steinmetz, LCSM, ass.CNRS, URA158, Universite Henri Poincare Nancy I, Vandoeuvre les Nancy Cedex, France
P.Delcroix, G.Le Caer, LSG2M,ass.CNRS, URA 119, Ecole des Mines de Nancy, Nancy Cedex, France

Impedance study of the PbO/PbOn/PbO_2 transformations in the anodic layer formed on Pb and Pb-Sb electrodes

S.Brinic, Dept. of Chemistry, Faculty of Technology, University of Split, Split, Croatia
M.Metikos-Hukovic, R.Babic, Dept. of Electrochemistry, Faculty of Chemical Engineering and Technology, University of Zagreb, Zagreb, Croatia

In situ FTIR and Raman spectroscopy of lead electrodes

G.L.J.Trettenhahn, G.E.Nauer, A.Neckel, Institute for Physical Chemistry, University of Vienna, Wien, Austria

A cyclic voltammetry and impedance study of the effects of Sb on the electrochemistry of Pb in H_2SO_4

F.Gobal, Chemistry Dept., Sharif University of Technology, Tehran, Iran

Influence of Sb, Sn, Ag and Ca on the temperature dependence of oxygen evolution on the lead dioxide electrode in sulphuric acid solution

B.Monahov, *D.Pavlov*, Central Laboratory of Electrochemical Power Sources, Bulgarian Academy of Sciences, Sofia, Bulgaria

Influence of additives on the processes of oxygen evolution on the PbO_2 electrode in H_2SO_4 solution

B.Monahov, D.Pavlov, Central Laboratory of Electrochemical Power Sources, Bulgarian Academy of Sciences, Sofia, Bulgaria

Influence of alloying additives on the electrochemical properties of the grid/corrosion layer/PAM /electrolyte system

M.Bojinov, D.Pavlov, Central Laboratory of Electrochemical Power Sources, Bulgarian Academy of Sciences, Sofia, Bulgaria

Electrochemical behavior of Pb/PbO_2 cells in binary electrolytes

C.M.Inga, M.V.Vazquez, C.P.De Pauli, Universidad Nacional de Cordoba, Fac. de Ciencias Quimicas, Dpto. Fisicoquimica, Cordoba, Argentina
I.G.R.Gutz, Universidade de Sao Paolo, Instotuto de Quimica, Sao Paolo, Brazil

Lead oxide as a photosemiconducting electrode

M.Sharon, Chemistry Dept., Indian Institute of Technology, IIT Powai, Bombay, India

Electrochemical behavior of lead and lead dioxide deposited on reticulated vitreous carbon

M.Zelazowska, A.Czerwinski, Department of Chemistry, Warsaw University, Warsaw, Poland

The influence of IO_3^- ions upon the electrochemical system $Pb/PbO_2/H_2SO_4$

A.Mateescu, F.Hojbota, S.C.Acumulatorul S.A.,Bucharest, Romania
C.Mateescu, Institute of Physics and Technology of Materials, Bucharest, Romania

The phase transition on the boundary metal- electrolyte under the influence of electrical current

E.Suleimenov, N.V.Gulevich, B.B.Aspandiyarov International Academy of Energetics named after A.Ainshtein, Almaty, Republic of Kazakhstan

Problem of batteries physical value

I.L.Varshavsky, N.V.Gulevich, B.B.Aspandiyarov, International Academy of Energetics named after A.Ainshtein, Almaty, Republic of Kazakhstan

GRID CORROSION

Effects of cobalt in lead-acid batteries

N.Bagshaw, Consultant, Stockport, UK

Effect of polarisation mode, time and potential on the properties of the passive layer on lead-tin alloys

P.Mattesco, N.Bui, P.Simon, Ecole Nationale Superieure de Chemie de Toulouse Laboratoire des Materiaux URA-CNRS 445, Toulouse, France
L.Albert, MetalEurop Recherche, Trappes, France

Study of service time of lead grid material with ellipsometry

L.J.Lei, Z.S.Tao, Dept. of Applied Chemistry, Chongqing University, Chongqing, Sichuan, P.R.China

PASTE PREPARATION AND FORMATION

Improvement of the formation efficiency of the tetrabasic lead sulphate for lead-acid batteries

I.Torcheux, J.P.Vaurijoux, a. De Guibert, CEAC (EXIDE Europe), Gennevilliers Cedex, France

Reaction mechanisms involved during the 4BS plate preparation by the Faure process

F.Joliveau, S.Grugeon-Dewaele, A.Delahaye-Vidal, Laboratoir de Reactivite et de Chemie des Solides, URA CNRS 1211, 33 Amiens Cedex, France
A. de Guibert, CEAC, Clichy Cedex, France

Transformation of tetrabasic lead sulphate into $PbSO_4$ by soaking in sulphuric acid: a topotactic but not pseudomorphous reaction

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Influence of phase composition of the paste on its structure and stability during battery operation

G.Petkova, D.Pavlov, Central Laboratory of Electrochemical Power Sources, Bulgarian Academy of Sciences, Sofia, Bulgaria

Dependence of the electric field on the specific surface conductivity of the samples PbO_2 , $3PbO.PbSO_4.H_2O$ and $4PbO.PbSO_4$

N.Saidi, H.Saidi, B.Saidani, Institute of Chem.Indust., University of Bejaia, Algeria
S.P.Stoilov, Institute of Physical Chemistry, Bulgarian Academy of Sciences, Sofia, Bulgaria

VRLA BATTERIES

Using conductance technology to monitor and prevent thermal runaway in VRLA batteries
M.J.Hlavac, Midtronics Inc., USA
D.Feder, Electrochemical Energy Storage systems, Inc., Madison, NJ, USA

Phenomena causing thermal runaway in VRLA batteries
D.Pavlov, Central Laboratory of Electrochemical Power Sources, Bulgarian Academy of Sciences, Sofia, Bulgaria

Modeling of local conditions in flooded lead-acid batteries in PV-systems
D.U.Sauer, Fraunhofer Institute for Solar Energy Systems ISE, Freiburg, Germany

Electrochemical modeling of lead-acid batteries under operating conditions of electric vehicles
E.Karden, P.Mauracher, F.Schope, Department of Power Electronics and Electrical Drives, Aachen University of Technology, Aachen, Germany

Development of valve regulated lead-acid battery for really good reliable EV
N.Hoshihara, EV Battery Development Center, Matsushita Battery Ind. Co., Ltd, Japan

Effects of carbon in negative plates on cycle-life performance of VRLA batteries
M.Shiomi, T.Funato, K.Nakamura, K.Takahashi, M.Tsubota, Lead-Acid Battery Laboratory, Japan Storage Battery Co., Ltd., Kyoto, Japan

Recharging VR batteries, the "Vinal" Ah-rule put into service again
G.Karlsson, Energy Systems Div., Ericsson Components AB, Stockholm, Sweden

Investigation into oxygen permeability of different microporous separators
A.L.Ferreira, Amer-Sil S.A., Zone Industrielle, Kehlen, Luxembourg

Heat effects in batteries
E.Kuzminskii, Scientific and Engineering Center "Technoelektrokhim", Kiev, Ukraine

Effect of gelling on the electrochemical behaviour of PbO_2 electrode in VRLA batteries
M.P.Vinod, K.Vijayamohanan, Physical Chemistry Div., National Chemical Laboratory, Pune, India
S.N.Joshi, Chemsolar Energy Systems Pvt., Ltd., Bangalore, India

Performance characteristics of VRLA cells
N.Mani, S.Ambalavanan, P.G.Balakrishnan, N.Venkatakrishnan, M.Devasahayam, Al.Alagappan, P.Warriyar, V.Muthumani, *S.Sekar,* CECRI, Karaikudi, India

The difficulty of development of VRLA batteries in china
D.Qiu, Guangzhou Storage Battery Enterprises Co., Ltd., Guangzhou, China

BATTERY TECHNOLOGY, PERFORMANCE AND TESTING

Special products for battery manufacture
F.Steffens, Consulting services, Neuchatel, Switzerland

Failure modes and the detection of the state of health of lead-acid batteries in PV-systems
J.Garche, H.Doering, A.Jossen, V.Spath, ZSW - Energy Storage and Energy Conversion Division, Ulm, Germany

Failure modes of lead-acid batteries returned during the warranty period
K.Fischer, Daramic, Inc., Norderstedt, Germany

Monitoring the battery status for photovoltaic system

M.Kim, Korea Research Institute of Standards and Science, Taejon, Korea

Simulation of the cast-on-strap process in a finite-element model

A.Tonnessen, K.Salamon, VARTA Baterie AG, R&D Center, Kelkheim, Germany
H.M.Tensi, Technical University Munich, Munchen, Germany

Lead and labor saving using the MAC/COS cast-on strap machine

K.P.Bennett, MAC Engineering and Equipment Company, Inc., Benton Harbor, MI, USA

Measurement of the ultra-low frequency impedance of lead-acid batteries

P.Mauracher, E.Karden, K.Rembe, Dept. of Power Electronics and Electrical Drives, Aachen University of Technology, Aachen, Germany

Impedance evolution during the cycling of maintenance-free lead-acid battery

Z.Stoynov, T.Nishev, V.Vacheva, Central Laboratory of Electrochemical Power Sources, Bulgarian Academy of Sciences, Sofia, Bulgaria

Nonstationary analysis of battery load performance

Z.Stoynov, T.Nishev, V.Vacheva, Central Laboratory of Electrochemical Power Sources, Bulgarian Academy of Sciences, Sofia, Bulgaria

Electric vehicle system study

Z.Stoynov, T.Nishev, V.Vacheva, Central Laboratory of Electrochemical Power Sources, Bulgarian Academy of Sciences, Sofia, Bulgaria

Industrial batteries in the electric power system of Electricite de France

P.Gagnol, Electricite de France/Direction des Etudes et Recherches, Groupe MPE, Moret-sur-Loing, France

Proper sealing for polypropylene batteries

A.S.Thiede, Automation Systems Consultants, Inc., Waubeka, WI, USA

Ecological aspects of battery scrap recycling

Z.Vaizgant, ELTA Ltd, St. Petersburg, Russia

An efficient battery voltage regulator for charging and charge equalization of lead-acid batteries in photovoltaic systems

P.R.Mishra, Electronics Research & Development Centre of India, Noida, India
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J.C.Joshi, Centre of Energy Studies, Indian Institute of Technology, New Delhi, India

Potentiostatic control systems management

P.Andreev, Central Laboratory of Electrochemical Power Sources, Bulgarian Academy of Sciences, Sofia, Bulgaria

Automated line and programmable power supplies for testing accumulator batteries

S.Gishin, G.Gigov, P.Goranov, Technical University, Sofia, Bulgaria
K.Kanev, JSC Energia,Targovishte, Bulgaria
M.Milusheva, AKUMICAR Co., Ltd., Montana, Bulgaria

Rapid partial charging of lead-acid batteries

T.G.Chang, D.M.Jochim, Cominco Ltd., Product Technology Centre, Mississauga, Ontario, Canada

Lead-acid vs. lead salt batteries: performance and design aspects

I.N.Basumallick, A.Mukherjee, N.Chatterjee, M.Chattapadhyay, Electrochemical Lab., Department of Chemistry, Visva Bharati, Santiniketan, India

What happens to batteries in PV-systems? Costs, lifetimes, strains

D.U.Sauer, G.Bopp, Fraunhofer Institute for Solar Energy Systems ISE, Freiburg, Germany
M.Bachler, J.Mittermeier, P.Sprau, Renewable Energy Group (WIP), Munchen, Germany
W.Hohe, Zentrum fur Sonnenenergie und Wasserstof (ZSW), Ulm, Germany
B.Willer, M.Wollny, Institut fur Solare Energieversorgungstechnik (ISET), Kassel, Germany