

LABAT'2005

13-16 June 2005, Varna, Bulgaria

Presented papers

VRLA BATTERIES AND NEW BATTERIES

Control of vital chemical processes in the preparation of lead-acid battery active materials

J.Pierson, Consultant, Brookfield, USA

Thermal phenomena in VRLAB

D.Pavlov, B.Monahov, A.Kirchev, D.Valkovska, Institute of Electrochemistry and Energy Systems, Sofia, Bulgaria

Heat generation in VRLA batteries during charging

H.Catherino, AMSRD-TAR-R/MS 121, USA RDECOM, Warren, USA

Analysis of gassing processes in VRLA/Spirally wound battery

A.Hammouche, M.Thele, D.U.Sauer, ISEA, RWTH Aachen University, Germany

Effect of electrolyte saturation on rate and efficiency of oxygen cycle in VRLAB

A.Kirchev, D.Pavlov, A.Gigova, Institute of Electrochemistry and Energy Systems, Sofia, Bulgaria

Investigation on self-discharge of gel valve-regulated lead-acid batteries

Y.Guo, J.Hu, M.Huang, Fuzhou University, China

New VRLA battery electrolyte immobilizing technique

A.Ferreira, Hollingworth & Vose Co., USA

Prudent lead-acid batteries for solar lighting

S.Ambalavanan, CECRI, India

ABLE project: advanced lead-acid battery with optimized management system for the photovoltaic application

E.Lemaire-Potteau, GENEC-CEA, France

D.Pavlov, G.Papazov, IEES, Sofia, Bulgaria

X.Vallve, TTA, Barcelona, Spain

N. Van der Borg, ECN, Petten, The Netherlands

J.F.Sarrau, Exide-CEAC, France

A study on quick charging method for small VRLA batteries

J.H.Yan, W.S.Li, South China Normal University, Guangzhou, China

C.I.Wang, Q.Y.Zhan, B.B. Battery Co., Guangzhou, China

Application of VRLA batteries in Tibet District Energy System

Q.Dengke, Guangzhou Hongying Power Sources Science and Technology Company Ltd. Guangzhou, China

Heat generation in VRLA battery – influence of separator type (poster)

D.Valkovska, D.Pavlov, A.Kirchev, Institute of Electrochemistry and Energy Systems, Sofia, Bulgaria

MODELS

A three-dimensional conductivity model for electrodes in lead-acid batteries

D.Edwards, S.Zhang, University of Idaho, Moscow, USA

An artificial neural network simulator of the performance of Sb-containing PbO₂ electrodes

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

Prediction of SoC effects on lead-acid battery characteristics using Neural network parameter modifier

N.Abolhasani, N.Gharib, H.Moqtaderi, M.Amin, F.Torabi, A.Mosahebi, University of Tehran, Iran
M.Hejabi, Niru Battery Manufacturing Co., Tehran, Iran

Simulation of lead-acid batteries using one-dimensional CFD model

V.Esfahanian, F.Torabi, University of Tehran, Iran

Modeling of kinetic reaction of the lead dioxide electrode in lead-acid battery by means of electrochemical impedance spectroscopy (poster)

M.Hejabi, A.Oweisi, H.Abedinpour, Niru Battery MFG Co., Tehran, Iran
N.Gharib, University of Tehran, Iran

ANN modeling of cold cranking test of sealed lead-acid batteries (poster)

H.Karami, AMICO Industrial Group, Tehran, Iran
M.A.Karimi, Payame-Noor University of Ardakan, Ardakan, Iran
M.Mahdipour, Sepahan Battery Industrial Complex, Oshtojan, Isfahan, Iran

NEW GRIDS

Lead film electrode as negative and positive plate of lead-acid battery

L.A.Yolshina, Institute of High-Temperature Electrochemistry, Urals Branch of Russian Academy of Sciences, Ekaterinburg, Russia

Porous glassy carbon modified with metals and their oxides as electrode materials in batteries. Selected electrochemical properties.

A.Czerwinski, J.Kotowski, Pruszkowska-Drachal, I.Paleska, Warsaw University, Poland
Z.Rogulski, Industrial Chemistry Research Institute, Poland

Lead-acid batteries with foam grids

S.M.Tabaatabaai, M.S.Rahmanifar, S.A.Mousavi, S.Shekofteh, Jh.Khonsari, H.Tabrizi, A.Tizpar, S.Shirzadi, N.Bashiri, R&D of Niru Battery Manufacturing Co. Tehran, Iran

Simultaneous optimization of the properties of engineered composite grids for lead-acid batteries

H.Warlimont, T.Hofmann, DSL Dresden Material-Innovation GmbH, Dresden, Germany

A low-cost lead-acid battery with high specific energy

S.K.Martha, B.Hariprakash, Indian Institute of Science, India
S.A.Gafoor, NED Energy Ltd., Hyderabad, India
A.K.Shukla, CECRI, Karaikudi, India

Effect of lead foam grid on performance of VRLA battery (poster)

C.S.Dai, T.F.Yi, D.L.Wang, X.G.Hu, Harbin Institute of Technology, Harbin, China

LEAD ALLOYS

Microstructure of new lead-acid electrode alloys

I.Mukaitani, Shin-kobe Electric Machinery Co.,Ltd., Nabari, Japan
H.Tsubakino, L.Liu, A.Yamamoto, S.Fukumoto, University of Hyogo, Himeji, Japan

Oxygen evolution reaction on lead-bismuth alloys in sulfuric acid solution

W.S.Li, X.M.Long, F.H.Wu, Y.M.Wu, H.Y.Chen, South China Normal University, Guangzhou, China
J.H.Yan, C.R.Zhang, B.B. Battery Co., Guangdong, China

Electrochemical behavior of lead alloys in sulfuric and phosphoric acid electrolyte

S.Li, H.Chen, Y.Wu, W.Li, X.Jiang, South China Normal University, Guangzhou, China
M.Tang, W.Weij, Zhuzhou Smelter Group Co. Ltd., Zhuzhou, China

The reduction behaviour of lead sulfate on different lead alloys in sulfate solutions investigated by *in situ* – X-ray diffraction and IR-spectroscopy

R.Krendelsberger, W.Artner, G.Nauer, University of Vienna, Austria

Influence of alloying elements on electrochemical and corrosion behaviors of Pb grid alloys

C.Ramirez, J.M.Hallen-Lopez, H.Dorantes-Rosales, U.Santiago, E.M.Arce, Instituto Politecnico Nacional, Mexico

Corrosion of low-antimony lead-cadmium alloys in conditions of long-term polarization

A.Nuzhny, VLADAR Enterprise Ltd., Khrakov, Ukraine

Application and properties of lead-calcium-tin-bismuth alloys for positive grids (*poster*)

J.Liang, H.Chen, Y.Wu, South China Normal University, Guangzhou, China
G.Xiao, H.Zhou, Zhuzhou Smelter Group Co. Ltd., Zhuzhou China

BATTERY TESTING

Testing challenges in the HEV laboratory: Integrating External Data Streams

R.Schaefer, Bitrode Corp. USA

Thermal analysis of lead-acid battery pastes and active materials

M.Matrakova, D.Pavlov, Institute of Electrochemistry and Energy Systems, Sofia, Bulgaria

Internal battery temperature estimation using series battery resistance measurements during cold temperatures

A.Hande, Lake Superior State University, USA

Charging processes by pulse methods of discharged lead-acid battery electrodes. I. Quantitative analysis for a flat negative electrode

C.D'Alkaine, UFSCar, Sao Carlos, Brazil
L.M. de Souza, P.R.Impinnisi, J. de Andrade, LACTEC, Curitiba, Brazil

The evaluation of performance and physical characteristics of lead-acid plates from different companies

A.Kozera, C.Tzeciuk, L.M. de Souza, P.R.Impinnisi, C.M.Garcia, LACTEC, Curitiba, Brazil

Improvement in manufacturing technology for punched grid production

P.Farina, SOVEMA S.p.A., Italy

Potentiometric measurement of state-of-charge of lead-acid battery by using a bridged ferrocene surface modified electrode (*poster*)

T.B.Issa, P.Singh, Murdoch University, Australia
M.V.Baker, University of Western Australia, Australia

Battery cycling life testing using mobile electrochemical laboratory (*poster*)

K.Belov, Central Laboratory of Mechatronics and Instrumentation, Sofia, Bulgaria
M.Mladenov, Institute of Electrochemistry and Energy Systems, Sofia, Bulgaria

NEGATIVE PLATE ADDITIVES

Fundamental study of effect of quinone structure in the lignin derivatives on negative electrode of lead-acid battery

N.Hirai, T.Tanaka, Osaka University, Japan

T.Ikeda, K.Magara, Forestry and Forest Product Research Institute, Ibaraki, Japan

Graphite and fiberglass additives for improving high rate partial state of charge cycle life

J.Valenciano, F.Trinidad, Exide Technologies, Spain

Significance of carbon additive in negative lead-acid battery electrodes

M.Calabek, P.Krivak, P.Baca, Technical University, Brno, Czech Republic

K.Micka, Heyrovsky Inst. Of Physical Chemistry, Prague, Czech Republic

Influence of polymer additives on the performance of lead-acid battery negative plate

G.Petkova, P.Nikolov, D.Pavlov, Institute of Electrochemistry and Energy Systems, Sofia, Bulgaria

Influence of the electrolyte concentration on the operation parameters of VRLA batteries (poster)

D.Pavlov, S.Ruevski, V.Naidenov, Institute of Electrochemistry and Energy Systems, Sofia, Bulgaria

Influence of sulphonates on electrochemical behavior of flat lead electrode in sulphuric acid solution (poster)

A.D.Dayanov, Y.P.Zaikov, V.F.Lazarev, M.G.Ivanov, Urals State Technical University, Ekaterinburg, Russia

V.B.Malkov, Urals Branch Of Russian Acad. of Sciences, Ekaterinburg, Russia

IMPEDANCE MEASUREMENTS

Investigation of the high-frequency resistance of a lead-acid battery

F.Huet, R.P.Nogueira, Universite Pierre et Marie Curie, France

P.Lailler, L.Torcheux, Exide Technologies - CEAC, France

Study of the "Coup de Fouet" of lead-acid cells as a function of their state-of-charge and state-of-health

A.Delaille, M.Perrin, CEA, GENEC, France

F.Huet, Universite Pierre et Marie Curie, France

Impedance based overcharging and gassing model for VRLA/AGM batteries

M.Thele, D.U.Sauer, ISEA, RWTH Aachen University, Germany

E.Karden, E.Surewaard, Ford Motor Company, Research Center, Aachen, Germany

Battery impedance characterization through inspection of discharge curve and testing with short pulses

A.Tenno, Tallinn University of Technology, Tallinn, Estonia

R.Tenno, Helsinki University of Technology, Espoo, Finland

T.Suntio, Tampere University of Technology, Tampere, Finland

SEPARATORS

New generation of non-woven gauntlets for tubular positive plates

V.Toniazzo, Amer-Sil S.A., Luxembourg

A new polyethylene separator for industrial heavy duty lead-acid battery

J.Deiters, W.Boehnstedt, J.Boesler, K.Ihmels, Daramic, LLC. Germany

AGM wrapping/stacking machine for both, motorcycle and automotive size

A.Schwetz, BM-Battery Machines GmbH, Austria

The closed loop – a dream for lead-acid batteries?

K.Lamm, PROCON, Aachen, Germany

Investigation of the porous structure of battery separators using different porometric methods (poster)

A.Gigova, G.Papazov, Institute of Electrochemistry and Energy Systems, Sofia, Bulgaria

POSITIVE PLATE

Battery condition monitoring (BCM) technologies about lead-acid batteries

T.Okoshi, K.Yamada, T.Hirasawa, Shin-Kobe Electric Machinery, Saitama-Ken, Japan
A.Emori, Hitachi Research Laboratory, Ibaraki, Japan

Study of lead sulfate precursor to positive active material in lead-acid batteries

Z.Yan, Shuangdeng Power Sources Group Co., Ltd., Nanjing, China
X.Hu, Harbin Institute of Technology, Harbin, China

Synthesis and characterization of lead dioxide active material for lead-acid batteries

J.Morales, N.Cruz, A.Caballero, University of Cordoba, Spain
G.Petkova, IEES, Sofia, Bulgaria

Tin effect on the crystal modifications of alpha and beta PbO₂ of the tubular positive electrode in lead-acid battery in charge

A.Dakhouché, O.Saoudi, University of Mohamed Boudiaf, Msila, Algeria
D.Pavlov, IEES, Sofia, Bulgaria

Formation and physicochemical properties of composite PbO₂ materials

A.B.Velichenko, T.V.Luk'yanenko, F.I.Danilov, Ukrainian State University of Chemical Technology, Dnepropetrovsk, Ukraine
R.Amadeli, University of Ferrara, Italy
D.Devilliers, Université Pierre et Marie Curie, France

Adsorption properties of lead dioxide

N.V.Nikolenko, A.B.Velichenko, Ukrainian State University of Chemical Technology, Dnepropetrovsk, Ukraine

Relationship between water departure and capacity loss of α and β -PbO₂ using an all solid-state system: estimation of proton coefficient diffusion

L.Zerroual, R.Fitas, Université Ferhat, Setif, Algeria

Behaviour of lead dioxide and lead electrodes in sulphuric acid media containing phosphoric acid and tin sulphate

A.Bhattacharya, P.Roy, I.Basumallick, Visva-Bharati University, India

Influence of the non-ionic surfactant Triton X-100 on electrocrystallization and electrochemical behavior of PbO₂

M.Ghaemi, Tarbiat Modares University, Iran
E.Ghafouri, Niru Battery MFG Co., Tehran, Iran

Nanostructured PbO₂: an active material with high efficiency for lead-acid batteries (poster)

J.Morales, N.Cruz, A.Caballero, University of Cordoba, Spain
G.Petkova, IEES, Sofia, Bulgaria

Lithium intercalation in active masses of lead-acid batteries (poster)

A.Momchilov, B.Banov, G.Papazov, S.Vassilev, B.Puresheva, Institute of Electrochemistry and Energy Systems, Sofia, Bulgaria
I.Abrahams, Queen Mary College, London, UK

Design and optimization of high efficiency lead-acid battery (poster)

B.Banov, A.Momchilov, G.Papazov, Institute of Electrochemistry and Energy Systems, Sofia, Bulgaria