

44th Power Sources Conference
June 14-17, 2010
The Riviera Hotel
Las Vegas, Nevada

Preliminary Program

MONDAY, JUNE 14

Session: 1

Battery Safety/Quality/Testing I

Monday / June 14, 2010 / 10:30 AM - 12:10 PM / Royale 3

Co-Chair: Julie Banner
NSWC Carderock

Co-Chair: Michael Brundage
Army CERDEC

1.1: Toward Safer Lithium Ion Batteries: Non-Flammable Electrolytes

Mary Patterson
EnerDel, Indianapolis, IN

1.2: Characterization of the Heat Release Rate and Gas Production of Lithium-Ion Battery Failures from Thermal Abuse

Ben Gould
Naval Research Laboratory, Washington, DC

1.3: Hazards due to Overdischarge in Lithium-ion Cylindrical Cells in Multi-cell Configurations

Judith Jeevarajan
NASA-Johnson Space Center, Houston, TX

1.4: Internal Shorts and Safety of Li-ion Batteries

Rosalind Takata
TIAX LLC, Cambridge, MA

1.5: Evaluation for Explosion Pressure of Abuse Lithium-ion Batteries

Kai-Hsiang Yen
Underwriters Laboratories Taiwan Co. Ltd., Taipei City, Taiwan

Session: 2

Aqueous Batteries I

Monday / June 14, 2010 / 10:30 AM - 12:10 PM / Royale 4

Chair: John Erbacher
Air Force Research Laboratory

2.1: Fabrication and Electrochemical Performance of Pouch-Type Anodes for a Lithium-Seawater Battery

Charles Patrissi
Naval Undersea Warfare Center, Newport, RI

2.2: Government Effort to Improve Ni-Cd Battery Charge Efficiency

Barry Newman
Naval Surface Warfare Center, Crane, IN

2.3: Extending Storage Life of Nickel-Hydrogen Electrodes Manufactured with Teflon T-30

Vu Pham
Eagle-Picher Technologies, LLC, Joplin, MO

2.4: Lessons Learned in Developing a Robust Separator System for Vented Ni-Cd and Other Alkaline Batteries (Back to the Future)

Barry Newman
Naval Surface Warfare Center, Crane, IN

2.5: Nickel-Zinc Batteries for Military Applications

Dan Squiller
PowerGenix Systems, San Diego, CA

Session: 3

Metal-Air Batteries I

Monday / June 14, 2010 / 10:30 AM - 12:10 PM / Royale 7

Co-Chair: Terrill Atwater
Army CERDEC

Co-Chair: Christopher Hacker
NSWC Crane

3.1: Recent Advances in the Chemistry of the Lithium-Air Battery

K.M. Abraham
Northeastern University, Boston, MA

3.2: **Effects of Nonaqueous Electrolytes on Primary Li/Air Batteries**

Wu Xu
Pacific Northwest National Laboratory, Richland, WA

3.3: **Lithium Oxide and Lithium Peroxide Organic Electrolytes for Lithium-Air Cells**

Donald Foster
Army Research Laboratory, Adelphi, MD

3.4: **Modeling and Simulation of Air Electrodes in Li-air Batteries during Discharge Processes**

Jim Zheng
Florida A&M University, Tallahassee, FL

3.5: **Oxygen Electrodes for Lithium Air Rechargeable Batteries**

Olubukun Oloniyo
Newcastle University, Newcastle Upon Tyne, United Kingdom

Session: 4

Battery Safety/Quality/Testing II

Monday / June 14, 2010 / 1:30 - 3:10 PM / Royale 3

Co-Chair: Jan Alllen
Army Research Laboratory

Co-Chair: Joseph Fellner
AFRL

4.1: **Thermal Runaway on Long Term Storage BB-2590 Lithium-ion Battery**

George Au
U.S. Army CERDEC, Ft. Monmouth, NJ

4.2: **The Safety and Implementation of Secondary Lithium Ion Batteries Aboard Navy Vessels**

David Delafuente
Naval Surface Warfare Center, Crane, IN

4.3: **Using Differential Capacity as an Indicator for State-of-Charge or State-of-Health**

Terrill Atwater
US Army RDECOM, CERDEC, Fort Monmouth, NJ

4.4: **Thermal Battery Tester Mistake Proofing and Uncertainty Characterization - An Update**

Joseph Garni
Sandia National Laboratories, Albuquerque, NM

4.5: **The Use of Computed Tomography in Battery Failure Analysis**

LeRoy Schaum
Raytheon Missile Systems, Neosho, MO

Session: 5

Aqueous Batteries II

Monday / June 14, 2010 / 1:30 - 2:30 PM / Royale 4

Chair: Susan Waggoner
NSWC Crane

5.1: **Advanced Pb-Acid Batteries for Potential High-Rate Power Applications**

Wenhua Zhu
Auburn University, Auburn University, AL

5.2: **Advantages in Transitioning to Valve Regulated Lead Acid (VRLA) Battery Platforms for Submarine Applications**

Christopher Hacker
NSWC Crane, Crane, IN

5.3: **Thermal Phenomena in Valve-Regulated Lead-Acid Batteries with Operating Closed Oxygen Cycle**

Yi Ding
US Army RDECOM-TARDEC, Warren, MI

Session: 6

Metal-Air Batteries II

Monday / June 14, 2010 / 1:30 - 3:10 PM / Royale 7

Co-Chair: Jeffrey Read
Army Research Laboratory

Co-Chair: Jason Leonard
NSWC Crane

6.1: **Carbon Nanotube/Carbon Nanofiber Mixed Papers as Air Electrodes in Li-air Batteries**

Jim Zheng
Florida A&M University, Tallahassee, FL

6.2: **Cathodes for Lithium Air Cells Using Ionic Liquids**

Tom Fuller
Georgia Institute of Technology, Atlanta, GA

6.3: High Power Air Electrode Designs

Wayne Bennett
Energizer, Westlake, OH

6.4: Preparation of Anion Exchange Pore-Filling Polymer Electrolyte Membranes and their Application to Zinc-Air Batteries

Young-Woo Choi
Korea Institute of Energy Research, Daejeon, Korea

6.5: A Look Into Silicon - Air Batteries

Gil Cohn
Technion-Israel Institute of Technology, Technion City, Haifa, Israel

Session: 7

Primary Lithium Batteries (incl. Liquid Reserve) I

Monday / June 14, 2010 / 3:30 - 5:10 PM / Royale 3

Co-Chair: Don Foster
Army Research Laboratory

Co-Chair: Dan Kieffner
NSWC Crane

7.1: Development of High Energy Hybrid Solid Cathode Primary System for Military Applications

Nachiappan Raman
SAFT America Inc., Valdese, NC

7.2: Development of High Energy Lithium Manganese Dioxide Primary Cell for Military Applications

Nachiappan Raman
SAFT America Inc., Valdese, NC

7.3: Safe Li-CF(x)/MnO(2) Hybrid Chemistry Primary Battery for Wearable Power

Xinrong Wang
Ultralife Batteries, Inc., Newark, NY

7.4: Advanced Battery Chemistry for Portable Power

Dong Zhang
Eagle-Picher Technologies, LLC, Joplin, MO

7.5: Development of Low Temperature Electrolyte for Li/CFx Batteries

Dong Sun
EaglePicher Technologies, Joplin, MO

Session: 8

Secondary Lithium Batteries/Lithium-Ion Batteries I

Monday / June 14, 2010 / 3:30 - 5:10 PM / Royale 4

Co-Chair: Wishvender Behl
Army Research Laboratory

Co-Chair: Patricia Smith
NSWC Carderock

8.1: TIAX CAM-7: High-Energy, High-Capacity Cathode Material for Lithium-Ion Batteries

Adrian Pullen
TIAX LLC, Cambridge, MA

8.2: Instability of Cathode Materials in Li-ion Batteries: Oxygen Loss and SEI Formation

Corey Love
Naval Research Laboratory, Washington, DC

8.3: New Cathode Materials for Lithium Ion Batteries

Jan Allen
Army Research Laboratory, Adelphi, MD

8.4: Electrochemical Properties of Sulfur with Various Particle Size as Cathode Material for Lithium Sulfur Batteries

Wook Ahn
Korea Institute of Energy Research, Daejeon, Korea

8.5: High Energy Density Cathode Materials for Li-ion Battery Applications

Nader Hagh
NEI Corporation, Somerset, NJ

Session: 9

Metal-Air Batteries III

Monday / June 14, 2010 / 3:30 - 5:10 PM / Royale 7

Co-Chair: Charles Patrissi
NUWC

Co-Chair: Stanley Rodrigues

Air Force Research Laboratory

9.1: **Lithium-Air Hybrid Batteries**

Arthur Doble
Yardney Technical Products, Inc./Lithion Inc., Pawcatuck, CT

9.2: **A High Energy Density Lithium/Sulfur-Oxygen Hybrid Battery**

Sheng Zhang
US Army Research Laboratory, Adelphi, MD

9.3: **Lithium Metal Air Battery Technology**

Benjamin Meyer
MaxPower, Inc., Harleysville, PA

9.4: **Li(0.36)La(0.57)TiO(3) as a Membrane in Li/Air Batteries**

Jeffrey Wolfenstine
Army Research Laboratory, Adelphi, MD

9.5: **Novel Polymer-Ceramic Composite Membranes for a Solid-State, Lithium-Air Battery**

Jitendra Kumar
University of Dayton Research Institute, Dayton, OH

TUESDAY, JUNE 15

PLENARY SESSION

Tuesday / June 15, 2010 / 8:30 - 10:00 AM / Royale 2

Session: 10

Primary Lithium Batteries (incl. Liquid Reserve) II

Tuesday / June 15, 2010 / 10:30 AM - 12:10 PM / Royale 3

Co-Chair: Jeff Swank
Army Research Laboratory

Co-Chair: Peter Keller
NSWC Carderock

10.1: **Mathematical Model of Lithium Poly-carbon Monofluoride (Li/CF_x) Discharge Rates**

Edward William
University of Idaho, Moscow, ID

10.2: **Performance Evaluation of Commercial CF, Materials in Lithium Batteries**

Jeffrey Read
Army Research Laboratory, Adelphi, MD

10.3: **Calorimetry on Discharging Li/CF(x) Cells**

Jeffrey Read
Army Research Laboratory, Adelphi, MD

10.4: **Prototype 15Ah, Dual Voltage Capable Half BA Pack with CFx Chemistry**

Christina Camarador
Quallion LLC, Sylmar, CA

10.5: **High Capacity Primary Battery for JTRS HMS Radio under Extreme Environments**

Benjamin Meyer
MaxPower, Inc., Harleysville, PA

Session: 11

Secondary Lithium Batteries/Lithium-Ion Batteries II

Tuesday / June 15, 2010 / 10:30 AM - 12:10 PM / Royale 4

Co-Chair: Richard Jow
Army Research Laboratory

Co-Chair: Wishvender Behl
Army Research Laboratory

11.1: **New and Improved Nonaqueous Electrolyte Components for Li-ion Batteries**

Bookeun Oh
TIAX LLC, Cambridge, MA

11.2: **Additives and Alternatives to the Ethylene Carbonate Electrolyte Solvent System**

Arthur Von Wald Cresce
Army Research Laboratory, Adelphi, MD

11.3: **Performance of Wide Operating Temperature Range Electrolytes in Quallion Prototype Li-Ion Cells**

Marshall Smart
Jet Propulsion Lab, Pasadena, CA

11.4: **Differentiating Contributions to Ion Transfer Barrier at Electrolyte/Graphite Interface from Interphasial Resistance and Li+-Desolvation**

Kang Xu
US Army Research Laboratory, Adelphi, MD

11.5: **Extending the Temperature Range of Li-Ion batteries for Harsh Environments**

John Battaglini
International Battery, Inc., Allentown, PA

Session: 12

Fuel Cells, Fuel Processing and Storage I

Tuesday / June 15, 2010 / 10:30 AM - 12:10 PM / Royale 7

Co-Chair: Terry DuBois
Army CECOM

Co-Chair: Deryn Chu
Army Research Laboratory

12.1: Gradient Carbon Nanotube/Nanofiber Electrodes for Ultra-Low Platinum Catalysts and Optimization of PEMFC Performance

Jim Zheng
Florida A&M University, Tallahassee, FL

12.2: Ultrasound Assisted Micro-emulsion for Synthesis of Uniformly Distributed Pt and PtCo Nano Particles

Charles Rong
Army Research Laboratory, Adelphi, MD

12.3: Effect of Synthetic Methods on Catalytic Kinetics for PtCo Nano Particles Coated on Rotating Disk Electrode

Rongzhong Jiang
Army Research Laboratory, Adelphi, MD

12.4: Promising Electro-Catalytic Behavior of Ternary Catalysts (Pt-Pd-Au) Towards Anodic Oxidation of Ethanol in Alkaline Fuel Cells: Analysis of Reaction Products and Influence of Temperature

Jayati Datta
Bengal Engineering and Science University, Howrah, West Bengal, India

12.5: Non-Precious Metal Catalysts for Oxygen Reduction in Electrochemical Power Devices

Deryn Chu
Army Research Laboratory, Adelphi, MD

Session: P

Poster Session

Tuesday / June 15, 2010 / 1:30 - 5:00 PM / Royale 1

P.1: High Throughput Synthesis and Screening for Discovery of Improved Electrode Materials for Lithium-Ion Batteries

Steven Kaye
Wildcat Discovery Technologies Inc, San Diego, CA,

P.2: Performance and Operating Characteristics of a 20W Class DMFC Stack

Dong-Hyun Peck
Korea Institute of Energy Research, Daejeon, , Korea

P.3: Water Transport in Alkaline Anion Exchange Membranes

Andrew Kiss
University of Connecticut, Storrs Mansfield, CT,

P.4: Development of a Methanol Steam Reformer Unitized with a High Temperature Polymer Electrolyte Fuel Cell

Sung-Dae Yim
Korea Institute of Energy Research, Daejeon, , Korea

P.5: Development of a Fuel Cell Mini-Bus and its Simulation Program

Minjin Kim
Korea Institute of Energy Research, Daejeon, , Korea

P.6: Development of the Computer-Aided Simulation for a 1 Kw Residential Power Generator Using PEMFC Stack

Minjin Kim
Korea Institute of Energy Research, Daejeon, , Korea

P.7: Durability Enhancement of Polymer Electrolyte Fuel Cells at Extreme Conditions : Cold Environmental Aspect

Gu-Gon Park
Korea Institute of Energy Research, Daejeon, , Korea

P.8: Current Distribution Analysis by the Segmented Cell of Polymer Electrolyte Fuel Cell

Young-Jun Sohn
Korea Institute of Energy Research, Daejeon, , Korea

P.9: Advancements Toward a Zero-Power Autonomous Aquatic Litoral Sensor Framework

Justin Biffinger
Naval Research Laboratory, Washington, DC,

P.10: Limitations of Air-Reactive Exothermic Chemical Heat Source for Use in Thermal Energy Conversion Devices

John Parker
Alloy Surfaces Company, Inc., Chester Township, PA,

P.11: Towards the Development of Silicon Nanostructure Based Anode for Thermal Batteries

Vojtech Svoboda
CFD Research Corp., Huntsville, AL,

P.12: High Temperature Mechanical Properties of Thermal Battery Separators

Anne Grillet
Sandia National Laboratories, Albuquerque, NM,

P.13: SiOC-Based Fabric Separators for Thermal Batteries

Hae-Won Cheong
Agency for Defense Development, Daejeon, , Korea

P.14: Synthesis and Characterization of Magnesium Oxide Nanoparticles and Their Use in the Thermal Battery Application

Younbong Park
Chungnam National University, Daejeon, , Korea

P.15: Deleterious Conductive Paths in High Voltage Thermal Batteries during Activation

Heath Norris
Raytheon Missile Systems, Tucson, AZ,

P.16: 5v Lithiated Nanospinel as Electrodes for Asymmetric Supercapacitors: Investigations of Particle Size and Porosity on the Device Performance

Rambabu Bobba
Southern University, Baton Rouge, LA,

P.17: Advanced Electrolytes for Extreme Temperature Supercapacitors

Christopher Rhodes
Lynntech, Inc., College Station, TX,

P.18: Development and Experimental Study of Mediator-enhanced Polymer Electrolyte Supercapacitors (MEPESCs)

Xiangyang Zhou
University of Miami, Miami, FL,

P.19: Development of Miniaturized Solid-State Thin-Film Battery Applied to Electrical Fuzes at Low Temperature

Hyunjin Ji
Agency for Defense Development, Daejeon, , Korea

P.20: The Polymer Piezoelectric Jellyfish Power Generator

Yeong-Jen Wu
National Cheng Kung University, Tainan City, , Taiwan

- P.21: **Passive 2-Phase Techniques to Control Temperatures in Power Systems**
Phillip Tuma
3M Electronics Markets Materials Division, Saint Paul, MN,
- P.22: **State of Health Monitoring • Implementation on Military Batteries using Commercial off-the-shelf Electronics Architecture**
Hari Nayar
Ultralife Corp., Newark, NY,
- P.23: **Power Sources Technology Roadmap**
Marc Gietter
US Army CERDEC, Ft. Monmouth, NJ,
- P.24: **Advanced Materials for High Power Density Batteries and Supercapacitors**
Christopher Rhodes
Lynntech, Inc., College Station, TX:
- P.25: **Hydrogen Production from Chlamydomonas Reinardtii by Solar Irradiation**
Andrea Nicolini
University of Perugia, Perugia, , Italy
- P.26: **High Impact Shock Survivability Study of Lithium Ion Polymer Cells for use in Ballistic Applications**
Edward Bukowski
Army Research Laboratory, Aberdeen Proving Ground, MD,
- P.27: **High Capacity Military Batteries Containing Pouch Li / CFx Cells**
Emmanuel Eweka
QinetiQ, Gosport, Hampshire, United Kingdom
- P.28: **Oligo (ethylene glycol)-Functionalized Silanes as Electrolytes for Li-Ion Batteries**
Jian Dong
Argonne National Laboratory, Argonne, IL,
- P.29: **The Preeminent Importance of Separator Resistance and Lithium Ion Conductivity on Electrochemical Performance Capabilities and Safety of Lithium Ion Cell Designs**
Kirby Beard
Porous Power Technologies, Plymouth Meeting, PA,
- P.30: **A Comparative Study of 3,5-di-tert-butyl-1,2-dimethoxybenzene and 2,5-di-tert-butyl-1,4-dimethoxybenzene for Overcharge Protection of Lithium-Ion Batteries**
Lu Zhang
Argonne National Laboratory, Argonne, IL,

P.31: Army Tactical Missile System (Army TACMS) Thermal Battery Surveillance and Stockpile Reliability

Robert Little
US Army RDECOM, Redstone Arsenal, AL,

P.32: A Study of the Magneli Phase Ti₄O₇ as a Catalyst Support for Rechargeable Metal-air Batteries Applications

Wei Qu
National Research Council of Canada, Vancouver, BC,

P.33: Si-Containing Liquid Polymer Electrolyte for Application in Lithium Ion Batteries

Zhengcheng Zhang
Argonne National Laboratory, Argonne, IL,

P.34: Development of an Electrolyteless and Oxygen-free High Performance Single Cell DMFC

Ellen Chen
Advanced Biomimetic Sensors, Inc, Germantown, MD,

P.35: High-Voltage Chemically-Stable Electrolyte for Thermal Batteries

Jinxiang Dai
US Nanocorp, Inc., Manchester, CT,

Session: 13

Secondary Lithium Batteries/Lithium-Ion Batteries III

Tuesday / June 15, 2010 / 1:30 - 3:10 PM / Royale 4

Co-Chair: Kang Xu
Army Research Laboratory

Co-Chair: Sheng Zhang
Army Research Laboratory

13.1: Saft Super-Phosphate(TM) and Beyond

Bridget Deveney
Saft America Inc., Cockeysville, MD

13.2: Super High Energy Density, Abuse Tolerant 18650-Size Cell Made With Si Negative for Military Applications

Jiang Fan
American Lithium Energy Corporation, San Marcos, CA

13.3: Low Temperature Performance Improvements in Lithium-ion Cells

Stuart Santee
Yardney Technical Products, Inc., Pawcatuck, CT

13.4: High-Performance Lithium Sulfur Cells for Portable Power Applications

Diana Marmorstein
Eagle-Picher Technologies, LLC, Joplin, MO

13.5: Rechargeable Lithium Cells Using Manganese Fluorides as Positive Electrodes

Wishvender Behl
US Army Research Laboratory, Adelphi, MD

Session: 14

Fuel Cells, Fuel Processing and Storage II

Tuesday / June 15, 2010 / 1:30 - 3:10 PM / Royale 7

Co-Chair: Shailesh Shah
Army CERDEC

Co-Chair: Rongzhong Jiang
Army Research Laboratory

14.1: Carbon Supported Cathode Catalysts for PBI Based HT-PEMFCs

Rambabu Bobba
Southern University, Baton Rouge, LA

14.2: Transport Properties and Performance Evaluations of PBI Membranes for High Temperature Polymer Electrolyte Fuel Cells

Rambabu Bobba
Southern University, Baton Rouge, LA

14.3: Development of the Purge Strategy for High Temperature Polymer Electrolyte Membrane Fuel Cell Systems

Feras Al-Saleh
Volkswagen AG, Wolfsburg, Germany

14.4: Mission Flexible Portable Fuel Cell Power Systems

Ian Kaye
Ultra Cell Corporation, Livermore, CA

14.5: Fuel Cell Technology Utilizing Borohydride and Hydrogen Peroxide

Richard Urian
Naval Undersea Warfare Center, Newport, RI

Session: 15

Secondary Lithium Batteries/Lithium-Ion Batteries IV

Tuesday / June 15, 2010 / 3:30 - 5:10 PM / Royale 4

Co-Chair: Jim Barnes
Dept. of Energy

Co-Chair: Harlan Lewis
NSWC Crane

15.1: LTO Reference Electrode Technology for Li-ion

Christina Camarador
Quallion LLC, Sylmar, CA

15.2: Life Model for Three Lithium Ion Cells in Parallel

Ralph White
University of South Carolina, Columbia, SC

15.3: Real World Considerations Affecting Net Gravimetric and Volumetric Energy Densities in Secondary Lithium Batteries

Frank Harwath
MicroSun Technologies, Lisle, IL

15.4: A First Principles-based Cell and Battery Simulation and Modeling Tool

Gerald Halpert
Global Aerospace Corp., Altadena, CA

15.5: Failure Analysis of Lithium Ion Cells Developed for Use in Modeling Efforts

Lloyd Zilch
Naval Surface Warfare Center, Crane, IN

Session: 16

Fuel Cells, Fuel Processing and Storage III

Tuesday / June 15, 2010 / 3:30 - 5:10 PM / Royale 7

Co-Chair: Thomas Reitz
Air Force Research Laboratory

Co-Chair: Ryan Miller
AFRL

16.1: Reaction Kinetics and Transport Phenomena of an Excess Moisture Oxidant Stream in the Ytria-Stabilized Zirconia and Strontium-Doped Lanthanum Manganite Composite Solid Oxide Fuel Cell Cathode

John Izzo
University of Connecticut, Storrs Mansfield, CT

16.2: AC Impedance Study of Mass Transfer Processes and Hydrogen Oxidation Reaction in Solid Oxide Fuel Cells

Ying Zhu
Auburn University, Auburn University, AL

16.3: The Effect of Nano NiO Powder Made By Pulsed Wire Evaporation (PWE) Method on SOFC Anode Functional Layer

Tak-Hyoung Kim
Korea Institute of Energy Research, Daejeon, Korea

16.4: Evaluation of Properties and Fabrication of Tubular Segmented-in-Series Solid Oxide Fuel Cell (SOFC) Unit Bundle

Tak-Hyoung Kim
Korea Institute of Energy Research, Daejeon, Korea

16.5: NexTech's FlexCell Planar SOFC Technology

Scott Swartz
NexTech Materials Ltd., Lewis Center, OH

WEDNESDAY, JUNE 16

Session: 17

Primary Lithium Batteries (incl. Liquid Reserve) III

Wednesday / June 16, 2010 / 8:30 - 9:50 AM / Royale 3

Co-Chair: Chris Hurley
Army CERDEC

Co-Chair: Rebecca Smith
NSWC Carderock

17.1: New Ultra High Power Primary Lithium Ion Cell

Herzel Yamin
Tadiran Battery Division, Elkron, Israel

17.2: Low Temperature Performance of High Temperature Lithium Alloy Primary Cells

Arden Johnson
Electrochem Solutions, Inc., Raynham, MA

17.3: **Energizer's Lithium Iron Disulfide Commercial Batteries: High Specific Energy and Reliability under Extreme Conditions**

Andrew Webber
Energizer, Westlake, OH

17.4: **Simulation of Electrolyte Flow during Activation of Advanced Lithium Oxyhalide Reserve Battery**

Eivind Listerud
EaglePicher Technologies, Joplin, MO

Session: 18

Secondary Lithium Batteries/Lithium-Ion Batteries V

Wednesday / June 16, 2010 / 8:30 - 10:10 AM / Royale 4

Co-Chair: Larry Scanlon
AFRL

Co-Chair: Kyle Deckard
NSWC Crane

18.1: **Next Generation Lithium-ion Cell for Satellite Applications**

Curtis Aldrich
GS Yuasa Lithium Power, Roswell, GA

18.2: **Performance of a Virtual Cell 3P8S Design Li-Ion Battery in a LEO Orbital Simulation**

Harlan Lewis
NAVSEA Crane, Crane, IN

18.3: **Qualification of Lithium Ion Cells for Space Applications**

Jeff Dermott
Eagle Picher Industries, Inc., Joplin, MO

18.4: **Development of 120V Batteries for the Orion Crew Exploration Vehicle**

Rob Gitzendanner
Yardney Technical Products, Inc., Pawcatuck, CT

18.5: **Launch Vehicle Battery Packs Using Nanophosphate Cells**

David Carmen
A123Systems, Inc., Ann Arbor, MI

Session: 19

Fuel Cells, Fuel Processing and Storage IV

Wednesday / June 16, 2010 / 8:30 - 10:10 AM / Royale 7

Co-Chair: Ronald Green
NSWC

Co-Chair: Deryn Chu
Army Research Laboratory

19.1: Gravity Effect on Channel-Visible PEM Fuel Cell

Chun-Ting Liao
National Taiwan University, Taipei City, Taiwan

19.2: Self-Heating Startup of a 30W-class DMFC Stack Under Cold Conditions

Seongyop Lim
Korea Institute of Energy Research, Daejeon, Korea

19.3: Hydrogen Production from Chlamydomonas Reinhardtii by Solar Irradiation

Andrea Nicolini
University of Perugia, Perugia, Italy

19.4: Logistic Fuel Reformer for TARDEC

Lyman Frost
Ceramatec, Inc., Salt Lake City, UT

19.5: Catalytic Burners and CO Reduction for Tactical Fuel Cell Systems Running On Logistical Fuel

Zachary Dunbar
Army Research Laboratory, Adelphi, MD

Session: 20

Advanced Materials and Processes I

Wednesday / June 16, 2010 / 10:30 AM - 12:10 PM / Royale 3

Co-Chair: Terrill Atwater
Army CERDEC

Co-Chair: Daphne Fuentevilla
NSWC Carderock

20.1: Nanoclays as Building Blocks for Electrochemical Energy Technologies

Michael Riley
New Mexico Institute of Mining and Tech., Socorro, NM

20.2: Nanomaterial Enhanced Alkaline (Zinc/MnO₂) Battery

Silke Spiesshoefer
Engineering Systems Solutions, Fayetteville, AR

20.3: **Bio-Battery: A Novel Micropower Source for Soldier Power and Portable Electronics**

Sameer Singhal
CFD Research Corporation, Huntsville, AL

20.4: **Bionano Power Cells for Early Detection and Classification of Traumatic Brain Injury**

Vijay Varadan
University of Arkansas, Fayetteville, AR

20.5: **High Capacity Anodes from Silicon Modified Nanofibers for Lithium Ion Batteries**

David Burton
Applied Sciences Inc., Waynesville, OH

Session: 21

Secondary Lithium Batteries/Lithium-Ion Batteries VI

Wednesday / June 16, 2010 / 10:30 AM - 12:10 PM / Royale 4

Co-Chair: John Erbacher
Air Force Research Laboratory

Co-Chair: Steve Vukson
Air Force Research Laboratory

21.1: **Large Format Lithium Ion SuperPolymer® Batteries for Large Power Storage**

Amit Majumdar
Electrovaya, Mississauga, Ontario, Canada

21.2: **Large Format Lithium Ion Battery System for the Mark 8 Mod 1 SEAL Delivery Vehicle**

David Mall
SAFT, Cockeysville, MD

21.3: **Design and Testing of Large Format Lithium Ion Cells**

Jeff Dermott
Eagle Picher Industries, Inc., Joplin, MO

21.4: **Large Format Li Ion Replacement Packs for Lead Acid Applications**

Christina Camarador
Quallion LLC, Sylmar, CA

21.5: **Advances in Nanophosphate Cells for Manned Ground Vehicle Applications**

Michael Wixom
A123Systems, Inc., Ann Arbor, MI

Session: 22

Fuel Cells, Fuel Processing and Storage V

Wednesday / June 16, 2010 / 10:30 AM - 12:10 PM / Royale 7

Co-Chair: Kevin Centeck
US Army TARDEC

Co-Chair: Charles Rong
Army Research Laboratory

22.1: Fuel Processing: Adsorbents for Removal of Organo-Sulfur Compounds in JP-8 Fuel

Dat Tran
Army Research Laboratory, Adelphi, MD

22.2: Reformates Desulfurization Using Regenerable Sorbent for Logistic SOFC Power Unit

Hongyun Yang
IntraMicron, Inc., Auburn, AL

22.3: Investigation of Metal Oxide for High Temperature Desulfurization

Charles Rong
Army Research Laboratory, Adelphi, MD

22.4: Effects of Hydrocarbon Chemical Class Composition on Autothermal Reforming of JP-8 Fuel

Terry DuBois
CECOM RDE Center, Fort Belvoir, VA

22.5: ATR Development for Reformation of Logistics Fuels

Christian Junaedi
Precision Combustion, Inc., North Haven, CT

Session: 23

Molten Salt Batteries (Primary & Secondary) I

Wednesday / June 16, 2010 / 1:30 - 3:10 PM / Royale 3

Co-Chair: Dave Ryan
AFRL

Co-Chair: Michael Ding
Army Research Laboratory

23.1: Thermophysical Property Measurements of Thermal Battery Materials

Geoff Swift
EaglePicher Technologies LLC, Joplin, MO

23.2: **Gas Evolution from Thermal Battery Materials**

Frank Krieger
Army Research Laboratory, Adelphi, MD

23.3: **Transient Electrical Conductivity of Zr/BaCrO₄ Heat Paper**

Hans Papenguth
Sandia National Laboratories, Albuquerque, NM

23.4: **A Comprehensive, Physics-Based Model for Thermal Batteries**

Marc Kenton
Erigo Technologies LLC, Enfield, NH

23.5: **Predicting Electrochemical Phenomena in Lithium Molten Salt Thermal Batteries**

John Hewson
Sandia National Laboratories, Albuquerque, NM

Session: 24

Secondary Lithium Batteries/Lithium-Ion Batteries VII

Wednesday / June 16, 2010 / 1:30 - 3:10 PM / Royale 4

Co-Chair: Steve Vukson
Air Force Research Laboratory

Co-Chair: John Erbacher
Air Force Research Laboratory

24.1: **Lightweight, High Power and -40C Capable Li-ion Battery**

Christina Camarador
Quallion LLC, Sylmar, CA

24.2: **High Power Lithium Ion Batteries for Aircraft Applications**

Michael Parrot
EaglePicher, Joplin, MO

24.3: **Ultra-High Rate Lithium Iron Phosphate Cylindrical Cells**

James Hodge
K2 Energy Solutions, Inc., Henderson, NV

24.4: **Current State and Future Progression of SAFT Ultra High Power Li-ion Technology**

Kamen Nechev
SAFT America Inc., Cockeysville, MD

24.5: High-Power Large Format Lithium Ion Batteries

Scott Ferguson
Saft America, Inc., Cockeysville, MD

Session: 25

Fuel Cells, Fuel Processing and Storage VI

Wednesday / June 16, 2010 / 1:30 - 3:10 PM / Royale 7

Co-Chair: Robert Mantz
ARO

Co-Chair: Justin Govar
NSWC Carderock

25.1: High Energy Biofuel Cell for Unattended Ground Sensors (UGS)

Nick Akers
Akermin Inc., Saint Louis, MO

25.2: Fuel Cells Systems for Military Battery Charging Applications

Marnie de Jong
US Army CERDEC, Aberdeen Proving Ground, MD

25.3: Light Weight Squad Battery Charging Using Fuel Cell Power Systems

Gregory Cipriano
Protonex Technology Corp., Southborough, MA

25.4: The Ion Tiger Fuel Cell UAV

Karen Lyons
Naval Research Laboratory, Washington, DC

25.5: Integrating Micro-Fuel Cell Power Systems into Persistent Stare Mobile and Stationary Platforms

Jon Rice
Adaptive Materials Inc., Ann Arbor, MI

Session: 26

Molten Salt Batteries (Primary & Secondary) II

Wednesday / June 16, 2010 / 3:30 - 5:10 PM / Royale 3

Co-Chair: Michael Ding
Army Research Laboratory

Co-Chair: Dave Ryan
AFRL

26.1: A Novel Detailed Mass-Transfer Electrochemical Model Based Simulator for the Design of Thermal Batteries

Nir Haimovich
Technion, Haifa, Israel

26.2: Use and Assessment of the Validity of the ETHER Software to Design Long Life Batteries

Emmanuel Durliat
ASB - Aerospatiale Batteries, Bourges, Cedex, France

26.3: A Systematic Approach to Thermal Battery Failure Investigations

Ben Jantson
Raytheon Missile Systems, Tucson, AZ

26.4: A Novel Instrument for Verifying the Correct Ordering of Thermal Battery Stacks

Marc Kenton
Erigo Technologies LLC, Enfield, NH

26.5: New Cathode Materials for Use in Thermal Batteries

Geoff Swift
EaglePicher Technologies LLC, Joplin, MO

Session: 27

Advanced Materials and Processes II

Wednesday / June 16, 2010 / 3:30 - 5:10 PM / Royale 4

Co-Chair: Jeff Wolfenstein
Army Research Laboratory

Co-Chair: Stanley Rodrigues
Air Force Research Laboratory

27.1: Processing and Thermoelectric Properties of Nanoscale CoSb(3)

Jeffrey Wolfenstine
Army Research Laboratory, Adelphi, MD

27.2: Performance Characteristics of Manganese, Lead Mixed Metal Oxide Cathode for Rechargeable Lithium Electrochemical Systems

Terrill Atwater
US Army RDECOM, CERDEC, Fort Monmouth, NJ

27.3: Li(1+X)Ni(1-Y-Z)Co(Y)Mn(Z)O(2) Cathode For High Power and Capacity Lithium-Ion Cells

Rambabu Bobba
Southern University, Baton Rouge, LA

27.4: Multifunctional Carbon Nanoarchitectures as Designer Platforms for Electrochemical Power Sources

Jeffrey Long
Naval Research Laboratory, Washington, DC

27.5: Nitrogen Doped Carbon as a Cathode Material for Lithium-Air Batteries

Padmakar Kichambare
Air Force Research Laboratory, Wright-Patterson AFB, OH

Session: 28

Hybrid Power and Alternate Power Systems I

Wednesday / June 16, 2010 / 3:30 - 5:10 PM / Royale 7

Co-Chair: Cynthia Lundgren
Army Research Laboratory

Co-Chair: Alexis Marruffo
AFRL

28.1: Micropower Betavoltaic Hybrid Sources

Peter Cabaay
City Labs, Homestead, FL

28.2: New Thermoelectric Materials and New System-Level Analysis Perspectives Using Battlefield Heat Sources for Battery Recharging

Terry Hendricks
Pacific Northwest National Laboratory, Corvallis, OR

28.3: Solar Photovoltaic Technology Assessment for Soldier-Portable and Mobile Power

Cao Chung
US Army CERDEC, Aberdeen Proving Ground, MD

28.4: Formation of Synthesis Gas Using Solar Concentrator Photovoltaics (SCPV) and High Temperature Co-electrolysis (HTCE) of CO₂ and H₂O

Lyman Frost
Ceramatec, Inc., Salt Lake City, UT

28.5: Army Stirling Engine Research and Development-Past, Present And Future

Thomas Podlesak
U.S. CERDEC, Aberdeen Proving Ground, MD

THURSDAY, JUNE 17

Session: 29

Molten Salt Batteries (Primary & Secondary) III

Thursday / June 17, 2010 / 8:30 - 10:10 AM / Royale 3

Co-Chair: Sam Stuart
NSWC Crane

Co-Chair: Clinton Winchester
NSWC Carderock

29.1: Advances in Thermal Battery Anodes

Ethirajulu Dayalan
The ENSER Corp., Pinellas Park, FL

29.2: Review of the LAN Technology in Thermal Batteries

Emmanuel Durliat
ASB - Aerospatiale Batteries, Bourges, Cedex, France

29.3: Alternative Electrolyte Binder Materials for Thermal Batteries

Geoff Swift
EaglePicher Technologies LLC, Joplin, MO

29.4: Advanced Cathode Materials for Thermal Batteries

James Pugh
The ENSER Corporation, Pinellas Park, FL

29.5: A NanoFoil-Heated Thermal Battery: Its Construction, Initiation, and Performance

Michael Ding
U.S. Army Research Laboratory, Adelphi, MD

Session: 30

Secondary Lithium Batteries/Lithium-Ion Batteries VIII

Thursday / June 17, 2010 / 8:30 - 10:10 AM / Royale 4

Co-Chair: Mark Hurley
Naval Air Systems Command

Co-Chair: Yuk Chan
Army CERDEC

30.1: High Energy BB-XX90 Lithium-ion Battery Upgrades

Laura Cristo

US Army RDECOM CERDEC, Fort Monmouth, NJ

30.2: Automotive Grade Nanophosphate Cells, Modules and Pack Evaluation

Les Alexander
A123Systems, Ann Arbor, MI

30.3: Assessment of Li Ion Batteries for Ground Combat Applications

Grayson Walker
General Dynamics Land Systems, Woodbridge, VA

30.4: BB-XX80 Rechargeable Lithium-ion Battery as Zinc-Air BA-8180 Equivalent

Laura Cristo
US Army RDECOM CERDEC, Fort Monmouth, NJ

30.5: Advanced Lithium-Polymer Battery Materials for Hybrid Power Systems

Douglas Campbell
ADA Technologies, Inc., Littleton, CO

Session: 31

Charging Techniques and State-of-Health Technologies

Thursday / June 17, 2010 / 8:30 - 10:10 AM / Royale 7

Co-Chair: George Au
Army CERDEC

Co-Chair: Dave Ryan
Air Force Research Laboratory

31.1: Lithium Ion Battery Management System and Cell Performance

Greg Miller
EaglePicher Technologies, LLC, Joplin, MO

31.2: Accurate Lithium Battery System Modeling Based on Cell Level Data

ZengMing Wang
EnerDel, Indianapolis, IN

31.3: Removing the Resistance to Charging and Discharging NiMH and Li-ion Batteries

Robert O'Brien
MHD Technologies, Victoria, BC, Canada

31.4: **Estimating State of Charge in Lead Acid Batteries Using Diamagnetic Measurements**

Joern Tinnemeyer
Cadex Electronics, Richmond, BC, Canada

31.5: **A Charge Equalizer for Improved Battery Life on an Electric Vehicle**

Stacey Page
University of Idaho, Moscow, ID

Session: 32

Molten Salt Batteries (Primary & Secondary) IV

Thursday / June 17, 2010 / 10:30 AM - 12:10 PM / Royale 3

Co-Chair: Clinton Winchester
NSWC Carderock

Co-Chair: Sam Stuart
NSWC Crane

32.1: **Thin Film Thermal Batteries**

David Harney
Advanced Thermal Batteries, Inc., Cockeysville, MD

32.2: **Thin Cell Components for Thermal Batteries**

Joe Edington
EaglePicher Technologie LLC, Joplin, MO

32.3: **Study of Cell Performance in Long-Life Thermal Battery Design Space**

Dan Wesolowski
Sandia National Laboratories, Albuquerque, NM

32.4: **Performance Tests of DSU-33 Thermal Battery for STAR Application**

Michael Ding
U.S. Army Research Laboratory, Adelphi, MD

32.5: **Accelerated Aging and Performance Comparison of Iron Disulfide vs Cobalt Disulfide Thermal Batteries**

R. Todd Snyder
Naval Surface Warfare Center, Crane, IN

Session: 33

Hybrid Power and Alternate Power Systems II

Thursday / June 17, 2010 / 10:30 AM - 12:10 PM / Royale 7

Co-Chair: Thanh Tran
NSWC Carderock

Co-Chair: Jonathan Cristiani
Army CERDEC

33.1: Intelligent Hybrid Soldier Power Management Dramatically Lightens Man-Portable Battery Weight

Phil Robinson
Protonex, Southborough, MA

33.2: Power Systems for Micro Aerial Vehicles

Mark Roosz
Air Force Research Laboratory, WPAFB, OH

33.3: New Developments in Marine Corps Portable and On-Board Vehicular Power Programs

Clint Govar
Marine Corps Systems Command, Quantico, VA

33.4: Design Development and Testing Of A Rapidly Deployable Man-Transportable Renewable Energy System

Eric Shields
Naval Surface Warfare Center, Carderock, West Bethesda, MD

33.5: 160 Watt Portable Free Piston Stirling Power Source

Brian Freeman
Radiance Technologies, Auburn University, AL