

Large Lithium Ion Battery Technology and Application Symposium

(LLIBTA 2014)

Held at AABC Asia 2014

**Kyoto, Japan
20-21 May 2014**

ISBN: 978-1-5108-0402-9

Printed from e-media with permission by:

Curran Associates, Inc.
57 Morehouse Lane
Red Hook, NY 12571



Some format issues inherent in the e-media version may also appear in this print version.

Copyright© (2014) by Advanced Automotive Batteries (AAB)
All rights reserved.

Printed by Curran Associates, Inc. (2015)

For permission requests, please contact Advanced Automotive Batteries (AAB)
at the address below.

Advanced Automotive Batteries (AAB)
P.O. Box 1059
Oregon House, CA 95962

Phone: (530) 692-0140
Fax: (530) 692-0142

info@advancedautobat.com

Additional copies of this publication are available from:

Curran Associates, Inc.
57 Morehouse Lane
Red Hook, NY 12571 USA
Phone: 845-758-0400
Fax: 845-758-2634
Email: curran@proceedings.com
Web: www.proceedings.com

TABLE OF CONTENTS

SESSION 1: NEXT GENERATION LI-ION CELL MATERIALS

Next Generation Li-Ion Cell Materials	1
<i>Yoshio Ukyo</i>	
Advanced Materials Development for Li-Ion Batteries.....	10
<i>Kisuk Kang</i>	
Materials and Application Challenges of Layered Li-Excess Mn-Ni Oxide Cathode	30
<i>Nick Wu</i>	
Element Selective Evaluation of Cation Mixing by Anomalous Scattering X-ray Diffraction	39
<i>Kenji Sato</i>	
Interface between Lithium and Solid Electrolytes	51
<i>Osamu Yamamoto</i>	

SESSION 2: ROADMAP FOR LITHIUM-ION CELL MATERIALS DEVELOPMENT

Progress of Laminate Cells and Requirements of Battery Materials for xEVs	65
<i>Chika Amemiya</i>	
Roadmap for the Development of Lithiated Metal-Oxide Cathodes with Enhanced Performance.....	71
<i>Dong Joon Ihm</i>	
Anode Development for xEV Batteries	86
<i>Jian-Guo Ren</i>	
Recent Development of Silicon-Based Anodes at Shin-Etsu.....	100
<i>Tetsuo Nakanishi</i>	
Electrolyte Development for xEV Batteries.....	110
<i>Qiao Shi</i>	
Influence of Cell Materials on Li-Ion Battery Cost.....	120
<i>Klaus Brandt</i>	
The Possibility of "Pouch" in xEV Battery	133
<i>Masataka Okushita</i>	
LiB Materials Market Trends.....	139
<i>Sachiya Inagaki</i>	

LIGHT-AND SPECIALTY-EV TECHNOLOGY AND MARKET

Battery Market for Light Electric Vehicles	149
<i>Hiroshi Mukainakano</i>	
Lithium-Ion Battery for a Dual-Battery System in a Car Utilizing Conventional Technology.....	156
<i>Gaku Kamitani</i>	
High Performance Lithium-Ion Battery for Motorcycles	166
<i>Kazunori Ozawa</i>	
Recent 18650 Li-Ion Battery Development for EV/LEV Applications.....	178
<i>Mo Hua Yang</i>	
Public Transportation Powered by Wanxiang A123 Systems Asia	192
<i>Xinbao Gao</i>	
Battery Systems for Commercial and Industrial Electric and Hybrid Vehicles: Technical Challenges.....	207
<i>Beatrice Lacout</i>	

POSTERS

LITHIUM-ION CELL MATERIALS

Solid-State Battery Formulations: Influence of Compositions and Combinations.....	218
<i>Dee Strand</i>	
Heraeus Porocarb® – a New Class of Additives for Electrodes in Lithium Ion Cells.....	221
<i>Christian Neumann</i>	

Analysis of Advantages and Disadvantages of Different Anode Materials and Prospect Outlook	233
<i>Wenping ZANG</i>	
Water-Based PVDF Binder for Improved Performance and Processing of Batteries	239
<i>Roberta Colombo</i>	
New PVDF Binder for Balanced Flexibility and Adhesion of Electrodes	244
<i>Milena Stanga</i>	
The Electrochemical Properties of the Modified $0.6\text{Li}[\text{Li}_{1/3}\text{Mn}_{2/3}]\text{O}_2 - 0.4\text{Li}[\text{Ni}_{2/5}\text{Co}_{1/5}\text{Mn}_{2/5}]\text{O}_2$ Cathode Materials for Lithium Batteries	250
<i>Hsiu-Fen Lin</i>	
A Comprehensive Approach to the Conductive Carbon Percolation Network in Lithium-Ion Battery Cathodes	255
<i>Pirmin Ulmann</i>	
Novel Conductive Carbon Additives for Ultra-High-Density Electrodes.....	260
<i>Satoshi Kubota.</i>	
New Carbon Coating Under LFP Active Material Layer Improves LIB Performance.....	265
<i>Yusuke Otsuka</i>	
Development of Novel Carbon Black Conductors for Lithium-Ion Batteries.....	271
<i>Togo Yamaguchi</i>	
Advanced Electrolytes for High-Voltage Lithium-ion Battery	275
<i>Ran Shi Wang</i>	

CELL DESIGN

Performance and Application of Lithium-Ion Capacitors	280
<i>Chisato Marumo</i>	
Fabrication and Electrochemical Performance of a Large-Size All-Solid-State Lithium-Ion Battery	287
<i>Satoshi Fujiki</i>	
High-Performance Lithium-Ion Aqueous Battery for Large-Scale Energy-Storage, Automobile and Renewable Energy Applications	292
<i>Zhumabay Bakenov</i>	
Synthesis of Hierarchical Porous Sulfur/Polypyrrole/Multiwalled Carbon Nanotube Composite Cathode for Lithium Batteries.....	299
<i>Yongguang Zhang</i>	

BATTERY MANAGEMENT, TESTING, AND SIMULATION

Failure Analysis Testing of a Cycle Aged Automotive Lithium-Ion Battery Electrolyte.....	303
<i>Paul Voelker</i>	
Analog Electronics for Cell Measurement and Balance in Large Lithium-Ion Battery Packs	309
<i>Michael Kultgen</i>	
Internal Impedance Estimation of Lithium-Ion Battery Using Arbitrary Waveform.....	315
<i>Yuki Tominaga</i>	
Output Fading Mechanism of Mixed Composite Cathode in Lithium-Ion Battery	318
<i>Kaori Hibino</i>	
Performance Evaluation of Wireless Battery Management System.....	323
<i>Inseop Lee</i>	
Safety and Performance Testing for Automotive Batteries.....	329
<i>Yuichi Aoki.</i>	

OTHER TOPICS

Integration of Aluminium in Lithium-Ion Battery Packs.....	334
<i>Mathieu Grandcolas</i>	
Lithium-Ion Battery Systems for Fully Electrical and Hybrid Light Aircraft Prototypes.....	337
<i>Hichem Smaoui</i>	
Energy-Storage Technology Requirements for Heavy (Hybrid) Electric Commercial Vehicles – A Promising Growing Market and Durability Reference for High-Tech Batteries	343
<i>Samu Kukkonen</i>	

Lithium-Ion Battery Cooling by Direct Liquid Immersion.....	349
<i>Hirokazu Hirano</i>	

ADDITIONAL PAPER:

Three-Dimensional Electrochemical Li-ion Battery Modelling Featuring A Focused Ion-Beam/Scanning Electron Microscopy Based Three-Phase Reconstruction of a LiCoO₂ Cathode	355
---	------------

T. Hutzenlaub

Author Index