

TABLE OF CONTENTS

Anode Materials

Sl#	Title	Page#
1	Development of High Performance Graphite Anodes for Li-Ion Batteries - I. Barsukov, P. Zaleski (Superior Graphite Co.), F. Cao, and J. Prakash (Illinois Institute of Technology)	1
2	Optimisation of Natural Graphite and Metal-Graphite as Negative Electrode for Li-Ion Rechargeable Batteries - K. Zaghib, G. Nadeau, M. Masse, A. Guerfi, and F. Brochu (Institut de Recherche d'Hydro-Quebec)	12
3	Electrochemical Performance of Carbon Nanotube Materials in Lithium Ion Batteries - P. Liu, G. L. Hornyak, A. C. Dillon, T. Gennett, M. J. Heben, and J.A. Turner (National Renewable Energy Laboratory)	31
4	The Study of High Surface Area Graphite as Anode Material for Li Ion Batteries - D. Aurbach, B. Markovsky, A. Nimberger and E. Levi (Bar-Ilan University)	40
5	Effect of Carbon Coating on the Electrochemical Performance of Graphite as an Anode Material in Lithium-Ion Batteries - H. Wang, M. Yoshio (Saga University), K. Fukuda (Mitsui Mining Co., Ltd.), and Y. Adachi (Kyushu National Industrial Research Institute)	55
6	Effect of Surface Treatment of Aluminum Substrate on Lithium Deposition and Dissolution - S. Magaino, K. Sobue, M. Soga, A. Kawaguchi, A. Mozalev (Kanagawa Industrial Technology Research Institute), M. Harima, R. Soeda, Y. Taima, and Y. Sasaki (Tokyo Institute of Polytechnics)	73
7	Characterization of Fly Ash from Oil-fired Power Plants as Electrode Material for Lithium-ion Batteries - E. Yagasaki and S. Ujii (The Kansai Electric Power Company, Inc.)	81

8	Development of Ni Composite Coated Graphite as an Anode for Li-Ion Batteries with PC-Based Solvent - P. Yu, J. A. Ritter, and R. E. White and B. N. Popov (University of South Carolina)	86
9	Modeling the Lithium Intercalation Process in a Porous Carbon Electrode - G. V. Botte and R. E. White (University of South Carolina)	99
10	Irreversibility Compensated Tin Oxide Anodes for Li-Ion Batteries - M.A. Rzeznik, E.R. Boyer, and K.M. Abraham (Covalent Associates)	129
11	Composite SnO-Graphite Anodes for Lithium-Ion Batteries - J. Y. Lee, R. Zhang (National University of Singapore), and Z. Liu (Institute of Materials Research and Engineering)	136
12	Lithium Insertion in Sn-P and Sn-B-P Glasses - C. Gejke, E. Zanghellini, L. Borjesson (Chalmers University of Technology), L. Fransson and K. Edstrom (Uppsala University)	144
13	Graphite-Tin Composite Anodes for Lithium-Ion Battery - E. Dayalan (Eagle Picher Technologies, LLC)	150
14	Atomic Structure and Capacity of Tin-Based Composite Oxide (TCO) Glasses - A. N. Mansour, J. A. Zaykoski, and S. Dallek (Naval Surface Warfare Center) and S. Mukerjee (Northeastern University)	159
15	Mechanical Instability of Sn-Li Alloy Anodes - J. Wolfenstine, D. Foster, J. Read, W.K. Behl (Army Research Laboratory), and W. Luecke (National Institute of Standards and Technology)	172
16	Mg_2Sn as a New Anode Material for Lithium Secondary Batteries - H. Sakaguchi, H. Maeta, H. Honda, and T. Esaka (Tottori University)	178
17	Electrochemical Evaluation of Thin-Film Li-Si Anodes Prepared by Plasma Spraying - R. A. Guidotti, G. L. Scharrer, F. W. Reinhardt (Sandia National Laboratories), and T. McKecknie (Plasma Processes, Inc.)	184

- 18 Charge/Discharge Characteristics of SnO₂ Coated Graphite Negative Electrode 194
 - T.-H. Kang (Hong-Ik University), B.-W. Cho, W.-I. Cho (Korea Institute of Science and Technology), J.-B. Ju (Hong-Ik University), and K.-S. Yun (Korea Institute of Science and Technology)
- 19 Charge/Discharge Performances of Tin Oxides Thin Film Negative Electrodes 203
 - W.-I. Cho (Korea Institute of Science and Technology), S.-C. Nam (Korea University), Y.-S. Yoon, B.-W. Cho (Korea Institute of Science and Technology), H.-S. Chun (Korea University), and K.-S. Yun (Korea Institute of Science and Technology)
- 20 New Types of Composite Anodes for Lithium Ion Batteries - J. Yang, Y. Takeda, N. Imanishi, and O. Yamamoto (Mie University) 210
- 21 Li-Ion Cell Based on Li_{3-x}Co_xN Anode with Large Capacity 226
 - Y. Sakurai, T. Shodai, H. Arai (NTT Telecommunications Energy Laboratories), J. Yamaura, M. Hasegawa, S. Tsutsumi, and Y. Nitta (Matsushita Battery Industrial Co. Ltd.)

Cathode Materials

- 22 Solution-Electrode Interactions in Li-Ion Battery Systems 233
 - D. Aurbach, B. Markovsky, K. Gamolsky (Bar-Ilan University), U. Heider, and R. Oesten (Merck KGaA)
- 23 New Findings on the Phase Transitions in Li_(1-x)CoO₂, and Li_(1-x)NiO₂ Cathode Materials During Cycling: In Situ Synchrotron X-Ray Diffraction Studies 245
 - X.Q. Yang, X. Sun, and J. McBreen (Brookhaven National Laboratory)
- 24 A Study on the Irreversible Capacity During the First Cycling of LiNi_{1-y}Co_yO₂ (0 ≤ y ≤ 0.2) 257
 - K.-K. Lee and K.-B. Kim (Yonsei University)

25	Studies on Relationship Between Structure of Over-Charge State and Thermal Stability for LiNiO_2 Based Cathode Materials - X. Sun, X.Q. Yang, J. McBreen (Brookhaven National Laboratory-X. Sun), Y. Gao, M.V. Yakovleva (FMC Corporation), X.K. Xing, and M.L. Daroux (Gould Electronics Inc)	268
26	X-Ray Absorption Spectroscopic Study of $\text{LiAl}_y\text{Co}_{1-y}\text{O}_2$ Cathode for Li Rechargeable Batteries - W.-S. Yoon and K.-B. Kim (Yonsei University)	278
27	Chronoamperometric Studies of LiCoO_2 and LiNiO_2 Particles During Lithium-Ion Insertion/Extraction - K. Dokko, S. Horikoshi, M. Nishizawa, T. Itoh, T. Abe, and I. Uchida (Tohoku University)	290
28	Adhesion Studies of Cathode Materials in Lithium Batteries - M. Sugita and M. Yoshio (Saga University)	298
29	Olivine LiMePO_4 (Me: Co,Cu) as 4.8 and 2 V Positive Materials for Lithium Batteries - K. Amine (Argonne National Laboratory), H. Yasuda, and M. Yamachi (Japan Storage Battery Co., Ltd.)	311
30	Synthesis and Characterization of Vanadium Modified Chromium Oxides for Lithium Batteries - B. N. Popov, D. Zhang, A. Durairajan, Y. Xia, R.E. White (University of South Carolina), and Zh. Mao (Excellatron Corporation)	326
31	Preparation of High Performance Lithium Manganese Dioxide Spinel Cathode Material from Alkali Permanganates - A.K. Padhi, G.C. Pillai, and K. Pisarczyk (Carus Chemical Company)	339
32	Synthesis and Thermal Stability of Chemical Delithiated Lithium Manganese Oxide Spinels - M. Okada, T. Mouri (TOSOH Corporation), and M. Yoshio (Saga University)	350

- 33 Preparation of LiMnO_4 and LiNiO_2 by Pyrolysis of Amorphous Organic Precursors 364
- A. R. Naghash and J. Y. Lee (National University of Singapore)
- 34 Influence of LiMn_2O_4 Film and Particle Morphology on Electrochemical Properties of Li Ion Rechargeable Batteries 371
- D. Singh, R. Houriet, R. Vacassy, H. Hofmann (Swiss Federal Institute Of Technology), V. Craciun, and R. Singh (University of Florida)
- 35 Electrochemical Performance of Lithium Manganese Oxide Spinel for Secondary Lithium Batteries at (3+4)-volt Region 379
- M. Okada, T. Mouri (TOSOH Corporation), and M. Yoshio (Saga University)
- 36 *In Situ* Measurement of Cathode Transport Phenomena as a Function of Electrode Composition 393
- B. Hellweg and Y.-M. Chiang (Massachusetts Institute of Technology)
- 37 Effects of the Method of Cathode Synthesis on the Internal Resistance of Lithium/Silver Vanadium Oxide Batteries 401
- K. Chen, A.M. Crespi, C.L. Schmidt, and P.M. Skarstad (Medtronic, Inc.)
- 38 Sol-Gel- Based Template Synthesis and Li-Insertion Rate Performance of Nanostructured Vanadium Pentoxide 408
- C. J. Patrissi and C. R. Martin (Colorado State University)

Electrolytes

- 39 Effect of Organic Carbonate Additives on the Long Term Performance of Lithium/Silver Vanadium-Oxide (SVO) Batteries 417
- H. Gan and E.S. Takeuchi (Wilson Greatbatch Ltd.)
- 40 Alkyl Pyrocarbonate Electrolyte Additives for Performance Enhancement of Li Ion Cells 423
- M. C. Smart, B.V. Ratnakumar, and S. Surampudi (Jet Propulsion Laboratory)
- 41 Fluoro-Carbonate Solvents for Li-Ion Cells 434
- G. Nagasubramanian (Sandia National Labs)

42	Possibility of Trimethyl Phosphate as a Nonflammable Solvent for Lithium Ion Batteries - N. Shinoda, J. Ozaki, F. Kita, and A. Kawakami (Hitachi Maxell Ltd.)	440
43	Optimization of the Electrolyte Composition for the Lithium-ion Batteries using $\text{LiCr}_{0.1}\text{Mn}_{1.9}\text{O}_4$ as the Positive Electrode - O. Yamada, T. Nakagawa, M. Ishikawa, and M. Morita (Yamaguchi University)	445
44	Initial Reaction in Reductive Electrolysis of Lithium Electrolyte Solutions - E. Endo, (Sony Corporation)	452
45	Electrical Conductivity of Lithium Electrolyte Solution in Hetero-Phase Systems - M. Mizuhata, G. Cha, Y. Harada, H. Kimura, A. Kajinami, and S. Deki (Kobe University)	463
46	Synthesis of Cyclic Aza-Ether Compounds and Studies of Their Use as Anion Receptors in Non-Aqueous Lithium Halide Salts Solution - H.S. Lee, X. Sun, X.Q. Yang, J. McBreen (Brookhaven National Laboratory), J.H. Callahan, and L.S. Choi (Naval Research Laboratory)	471
47	Characteristics of the Organic Lithium Salts Containing C and N Elements as Anion Center - F. Kita, H. Sakata, A. Kawakami (Hitachi Maxell Ltd.), H. Kamizori, T. Sonoda, H. Nagashima (Kyushu University), J. Nie (Huazhong University of Science and Technology), and Y.L. Yagupolskii (Ukrainian Academy of Science)	480
48	Application to Lithium Battery Electrolytes of Lithium Organoborate Complexes - M. Handa, S. Sekiya, K. Kurashima (Tokyo Institute of Polytechnics), K. Usami (Denso Corporation), and Y. Sasaki (Tokyo Institute of Polytechnics)	485
49	New Polymer and Liquid Electrolytes for Lithium Batteries - J. McBreen, H.S. Lee, X.Q. Yang, and X. Sun (Brookhaven National Laboratory)	494

50	Ionic and Electronic Conductivity in ZrO ₂ - A.K. Jonsson, M. Stromme Mattson, and G. Niklasson (Uppsala University)	504
51	Mixed-Salt Polymer Electrolytes – PEO _n (x) LiCF ₃ SO ₃ (1-x) LiClO ₄ (n=12) - W. A. Henderson, S. Passerini, and W. H. Smyrl (University of Minnesota)	515
52	Ionic Transport in Ethylene Oxide-based Inorganic/Organic Composite Electrolytes - H.J. Walls, P.S. Fedkiw, S.A. Khan (North Carolina State University), and T.A. Zawodzinski (Los Alamos National Lab)	524
53	PEO-Based Network Solid Polymer Electrolyte and Its Electrochemical Properties - Y. Kang, H. Kim, E. Kim (Korea Research Institute of Chemical Technology), B. Oh, and J.H. Cho (Samsung Advanced Institute of Technology)	534
54	Comparative Studies of the Electrochemical and Thermal Stability of Composite Electrolytes for Lithium Battery Using Two Types of Boron-based Anion Receptors. - X.Q. Yang, H.S. Lee, X. Sun, and J. McBreen (Brookhaven National Laboratory)	540
55	Synthesis and Electrochemical Characterization of Novel Gradient Materials Consisting of Polymer Electrolyte and Polypyrrole. - J. Amanokura, Y. Suzuki, S. Imabayashi, and M. Watanabe (Yokohama National University)	551
56	Lithium Hectorite-Based Composite Electrolytes: Performance in Lithium-Ion Batteries - M. W. Riley, P. S. Fedkiw, and S. A. Khan (North Carolina State University)	556
57	Ion Diffusion in Polyelectrolytes: A Simple Monte Carlo Model - J.F. Snyder, M.A. Ratner, and D.F. Shriver (Northwestern University)	563

- 58 Performance of Li Electrode in Gel Polymer Electrolyte 572
 - Y. Matsuda, K. Kojima, T. Ohnishi, T. Shirai, and Y. Kadogawa
 (Kansai University)
- 59 Plasticized Polymer Electrolytes Based on ABS/PMMA Blends- 583
 Morphology and Ionic Conductivities
 - X. Hou and K.S. Siow (National University of Singapore)
- 60 Modeling of Ion Transport in Solid Polymer Electrolytes 593
 - B. G. Dixon, M. Bhamidipati, R. S. Morris, and E. D. Miller (Cape
 Cod Research, Inc.)
- 61 Optimization of Nanoporous Separators Based on Plasticized PVDF- 599
 HFP Copolymer
 - J. Hwang, H.M. Lee, S.J. Lee, S. Ahn, and (LG Chemical Ltd.)

Cell Development, Modeling, Performance and Safety

- 62 Thin Film Li Ion Microbatteries for NASA Applications 607
 - W. C. West, J. F. Whitacre, B. V. Ratnakumar, E. Brandon, J. O.
 Blossiu, and S. Surampudi (Jet Propulsion Laboratory)
- 63 Li-Ion Cell Development for Low Temperature Applications 619
 - C.K. Huang, S. Surampudi (Jet Propulsion Lab), J.S. Sakamoto
 (UCLA), and J. Wolfenstine (Army Research Lab)
- 64 What Terminates the Cycle Life of Rechargeable Lithium Batteries? 632
 - D. Aurbach, E. Zinigrad, H. Teller, (Bar-Ilan University), and P. Dan
 (Tadiran)
- 65 Studies on Capacity Fade of Lithium-Ion Batteries 645
 - D. Zhang, B. N. Popov, B. S. Haran, R. E. White (University of
 South Carolina), and Y. M. Podrazhansky (Advanced Charger
 Technology, Inc.)
- 66 Use of Pulsed Current and AC Impedance Characterization to 657
 Enhance Lithium-Ion Battery Performance
 - J. P. Fellner and R.A. Marsh (Air Force Research Laboratory)

67	Impedance Studies on Li-Ion Cells - J. Baker, P. Shah (Mine Safety Appliances Co.), G. Nagasubramanian, and D. Doughty (Sandia National Laboratories)	664
68	Impedance of Commercially Available Lithium-ion Batteries - Y. Saito, K. Takano, A. Negishi, K. Nozaki, and K. Kato (Electrotechnical Laboratory)	671
69	Investigation of Li-ion Battery with Ac Impedance Spectroscopy - T. Momma, K. Tsuchiya, and T. Osaka (Waseda University)	681
70	Redox Shuttle Additives for Overcharge Protection in Lithium Batteries - T. Richardson and P. Ross (Ernest Orlando Lawrence Berkeley National Laboratory)	687
71	Performance Characterization and Safety Testing of Lithium-ion Cells and Battery for Space Flight Applications - J. Jeevarajan (Lockheed Martin Space Operations), B. Bragg (NASA-Johnson Space Center), T. Piao (Arbin Instruments), S. Waldrop (Symmetry Resources, Inc.), M. Hughes, M. Peck, B. Tipton, Jr (Lockheed Martin Space Operations), and G. Steward (NASA-Johnson Space Center)	694
72	Storage Characteristics of Lithium Ion Cells B.V. Ratnakumar, M.C. Smart, J.O. Blosiu and S. Surampudi (Jet Propulsion Laboratory)	706
73	Impurity Effect in Aluminum Cathode Current Collector on Charging/Discharging Performance of Lithium Secondary Battery - K. Tachibana, T. Nishina, T. Endo, and K. Matsuki (Yamagata University)	719
74	Thermal Aspects of Lithium Ion Cells - H. Frank, P. Shakkottai, B. V. Ratnakumar, M. Smart, C.-K. Huang, P. Timmerman, and S. Surampudi (Jet Propulsion Laboratory)	730
75	Entropy Changes in Li-Ion Cells at Various Levels of Charge - M.L. Kronenberg (Mine Safety Appliances Company), C. Massingill, and N. Margalit (Marconi Corp.)	742
76	Thermal and Electrochemical Coupled Modeling of a Lithium-Ion Cell - W. B. Gu and C.Y. Wang (Pennsylvania State University)	748

77	Thermal Stability of Li-ion Cells - E. P. Roth (Sandia National Laboratories)	763
78	Evaluation of Fiber Separators for Use in Thermal Batteries - R. A. Guidotti and F. W. Reinhardt (Sandia National Laboratories)	772
79	Modeling of Long-Term Lithium/Silver Vanadium Oxide Battery Performance - C.L. Schmidt, A.M. Crespi, and P.M. Skarstad (Medtronic, Inc.)	781
80	The Effects of Laser Surface Reconstruction of Disordered Carbons on Performance - R. A. Guidotti and William R. Even	790
81	Palladium-Microencapsulated Graphite as the Negative Electrode for Li-ion Cells - P. Yu, B. S. Haran, J. A. Ritter, R. E. White and B. N. Popov	800
82	The Effect of Cathode Composition on the Thermal Characteristics of Lithium Ion Cells - H. Vaidyanathan	810