



Dr. Ralph E. White

September 1, 2018

Professor, Chemical Engineering
Birth date: November 6, 1942
Citizenship: U.S.
Birthplace: Clovis, New
Mexico
Security Clearance: None
Number of Children: 5

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Research Interests: Electrochemical Systems, Mathematical Modeling, Batteries, Corrosion,
& Electrodeposition

EDUCATION

B.S., Engineering, University of South Carolina, 1971
M.S., Chemical Engineering, University of California at Berkeley, 1973 (Advisor – Robert P.
Merrill)
Ph.D., Chemical Engineering, University of California at Berkeley, 1977 (Advisor – John S.
Newman)

EXPERIENCE

Educational

Assistant Professor, Chemical Engineering, Texas A&M University, 1977–1981
Associate Professor, Chemical Engineering, Texas A&M University, 1981–1985
Professor, Chemical Engineering, Texas A&M University, 1985–1993
Associate Head of the Department of Chemical Engineering, Texas A&M University, 1990–1993
Professor, Chemical Engineering, University of South Carolina, 1993–present
Chairman of the Department of Chemical Engineering, University of South Carolina, 1993–2000
Distinguished Scientist, University of South Carolina, 1993-present
Director, Center for Electrochemical Engineering, University of South Carolina, 1995-2000
Dean, College of Engineering and Computing, Univ. of South Carolina 2000-2005

Industrial

Chemical Engineer, Ethyl Corporation, Summer 1970
Nuclear Engineer, Mare Island Naval Shipyard, Summer 1971
Research Engineer, Chevron, Summer 1972
Consultant, Dow Chemical U.S.A., January 1979–March 1993
Consultant, Exxon Corp., March 1981–March 1982
Consultant, General Motors Corp., June 1984–June 1987
Consultant, Allied Corporation, November 1985–April 1986
Consultant, Boeing Corp., November 1999–December 2000, June 2006–March 2007
Consultant (Expert Witness), Rayovac, August 2002–November 2002
Consultant, (Expert Witness), DeNora North American, March 2002 –May 2003
Consultant, Vulcan, June 1999–2004
Consultant, (Expert Witness), AVANtech, June 2002–October 2005
COMSOL Certified Consultant, 2006–present
Consultant (Expert Witness), Energizer, June 2008–November 2008, November 2011-October 2012
Consultant, General Electric, May 2009-January 2015
Consultant (Expert Witness), Hydro Quebec, January 2011-June 2012
Consultant (Expert Witness), Celgard, October 2014-May 2015
Consultant (Expert Witness), EVE, September 2015-June 2016
Consultant, Energizer, January 2017–December 2017

Military

U. S. Navy Nuclear Submarines, MM2 (SS) DV, 1960–1968

HONORS AND AWARDS

Tau Beta Pi Spencer Fellow No. 16, 1971–1972
Halliburton Education Foundation Award of Excellence, 1987
Texas Engineering Experiment Station Senior Fellow, 1989–1992
Best Applied Paper for 1989, AIChE South Texas Section, paper entitled “Estimation of Electrode Kinetic Parameters of the Lithium/Thionyl Chloride Cell Using a Mathematical Model,” by T. I. Evans and R. E. White
Best Paper of the Conference, “An Electrochemically Based Performance Model of a Nickel-Cadmium Battery Cell,” by D. Fan and R. White, Fifth Annual Battery Conference on Applications and Advances, Long Beach, California, January 16–18, 1990
Texas A&M University Association of Former Students Distinguished Achievement Award for Research, 1990
E. H. Brockett Professor of Chemical Engineering, 1990
Battery Division Research Award, The Electrochemical Society, Inc., 1991
Electrodeposition Division Research Award, The Electrochemical Society, Inc., 1992
Journal of the American Electroplaters and Surface Finishers Society, “Silver Medal Award, Best Paper in '93” award for paper entitled “Characterization of Amorphous Ni-Cr-P Electrodeposits” by Terry R. Guilinger, James E. Voytko, Ralph E. White, and Ken-Ming Yin
Member of the Advisory Board of the *Journal of Applied Electrochemistry*
College of Engineering Research Award, University of South Carolina, Spring, 1998
Fellow, The Electrochemical Society, Inc., 1999.
Scientific Achievement Award, American Electroplaters and Surface Finishers Society, 1999
2004 Palmetto Pillar Award for Technology in Education, Columbia Chamber of Commerce
Fellow, American Institute for Chemical Engineers, 2011
Russell Research Award for Science, Mathematics, and Engineering, University of South Carolina, 2011
NASA Engineering and Safety Center, Group Achievement Award to Wilkinson Microwave Anisotropy Probe Battery Operations Problem Resolution Team, 2012
NASA Engineering and Safety Center, Group Achievement Award to NASA Lithium Ion Thermal Runaway Assessment Team, 2013
Fellow, American Association for the Advancement of Science (AAAS), 2013
Olin Palladium Award, The Electrochemical Society, 2013
Vittorio de Nora Award, The Electrochemical Society, 2016
Henry B. Linford Award, The Electrochemical Society, 2018

Student Awards by The Electrochemical Society

Tom Evans, 1987 Student Research Award of the Battery Division
Jenn-Feng Yan, 1994 Morris Cohen Graduate Student Award of the Corrosion Division
Pauline De Vidts, 1994 Student Research Award of the Battery Division
Venkat Subramanian, 2001 Student Research Award of the Battery Division
Venkat Subramanian, 2002 IE&EE Division Student Achievement Winner

Parthasarathy Gomadam, 2003 IE&EE Division Student Achievement Winner
Long Cai, 2011 H. H. Dow Memorial Student Award of the IE&EE Division of The
Electrochemical Society
Student Award by the American Institute of Chemical Engineers
Bala S. Haran, 1995 Graduate Student Paper Award, First Place, Environmental Division

PROFESSIONAL LICENSES

Registered Professional Engineer, Texas No. 47441

SOCIETY MEMBERSHIPS

American Institute of Chemical Engineers
The Electrochemical Society
National Society of Professional Engineers Member No. 104040478
International Society of Electrochemists
National Association for Surface Finishing (formerly American Electroplaters and Surface
Finishers Society)
Society for Industrial and Applied Mathematics
National Association for the Advancement of Science
Phi Beta Kappa
Tau Beta Pi
Omega Chi Epsilon
Omicron Delta Kappa
Phi Eta Sigma
Pi Mu Epsilon

PROFESSIONAL ACTIVITIES

National Research Council, Commission on Physical Sciences, Mathematics, and Applications

Appointed Member of the Committee on Electrometallurgical Techniques for DOE Spent
Fuel Treatment, 1998-2000
Certificate of Appreciation from Army Research Laboratory Technical Assessment Board
as member of Panel on Sensors and Electron Devices, 2003

The Electrochemical Society

Chairman of the South Texas Section of The Electrochemical Society, 1986–1987
Divisional Editor for Industrial Electrolytic, Electrochemical Society, 1987–1990
Chairman of the Industrial Electrolytic Division of The Electrochemical Society, 1988–
1990
Treasurer of The Electrochemical Society, 1990–1994
Chairman, Contributing Membership Committee of The Electrochemical Society, 1995–
1998
Chairman of the Financial Policy Advisory Committee, The Electrochemical Society,
2007–2010

Member of the Honors and Awards Committee of The Electrochemical Society, Fall 2010
– present

National Science Foundation

Member of Several Review Panels, 1986–present

American Institute of Chemical Engineers

Chairman AIChE Area 1e National Program Planning Committee, 1986–1988
Member of the Executive Committee of the Heat Transfer and Energy Conversion
Division of the AIChE, 1988–1991

American Electroplaters and Surface Finishers Society

Research Board, 1994-1999; Vice Chairman, Finance, 1995–1999

Project Lead The Way, Inc.

Member of the National Oversight Committee, 2003

NASA

Member of NESC Electrical Power Technical Discipline Team, August 2009 – present

DOE

Accepted the invitation and attended the DOE Hydrogen Program and Review
Technologies 2009 Annual Merit Review and Peer Evaluation, Energy Storage, as a
reviewer, which was held 18-22 May 2009.

Accepted the invitation to be a reviewer for the 2010 DOE Hydrogen and Vehicle
Technologies Annual Review and Peer Evaluation, Energy Storage, which was held 6-11
June 2010.

UNIVERSITY SERVICE

Texas A&M University

AIChE Student Chapter Advisor, 1977–1978
Tau Beta Pi Student Chapter Advisor, 1979–1983
Chairman of Council of Principal Investigators, 1990–1991
Member of the Search Committee for Associate Provost for Research, 1991-1992

University of South Carolina

Chairman, Search Committee for Dean of the College of Science and Mathematics, 1993-
1994
Member, Fellowships and Summer Programs Advisory Committee, 1994-1996
Chairman of the Goldwater Scholarship Committee, 1995-1996
Member, University Committee on Tenure and Promotion, 1995-1998
Member, Search Committee for Vice President for Research, 1999-2000
Member, Board of Directors, South Carolina Manufacturing Extension Partnership, 2001-
2003

Member, Board of Directors of the USC Research Foundation, 2002-2004
Member, Incubator Advisory Committee, 2002-2004

RECENT INVITED PRESENTATIONS

- REDCOM Power & Energy IPT Modeling and Simulation Workshop, 30-31 October 2007, Milpitas, CA 95035, Mathematical Modeling of Lithium Ion Batteries
- Invited to speak and co-chair the Industrial and Electrochemical Engineering Session G2 Tutorial Symposium on Electrochemical Engineering in Honor of Professor John Newman's 70th Birthday at the 214th Electrochemical Society, October 2008, and gave a presentation on "Mathematical Modeling of Lithium Ion Batteries."
- Invited to present a lecture at the International Conference on Electrochemical Power Systems (ICEPS-2008, 26-28 November 2008, in Thiruvananthapuram, Kerala, India, which I declined.
- Invited to speak at the 3rd International Conference on Advanced Lithium Battery for Automotive Applications, to be held in Seoul, Korea from 8-10 September 2010, which I declined.
- Invited to speak at the Society for the Advancement of Science and Technology and the Central Electrochemical Institute's 9th International Symposium on advances in Electrochemical Science and Technology, Chennai, India, to be held 2-24 December 2010, which I declined.
- Invited to speak at the University of Maryland, Distinguished Seminar Series, "Physics Based Modeling of Lithium Ion Cells and Batteries," November 4, 2011.
- Invited to speak at GM India Symposium, November 14, 2011.
- Invited talk at the General Electric Global Electrochemistry Symposium 2012, "Mathematical Modeling of Lithium-ion Batteries," September 25, 2012.
- Invited speaker at the ESRN Lithium Ion Battery Degradation Workshop, November 22, 2013, declined.
- Invited speaker, "Mathematical Modeling of Lithium Ion Cells," University of Southern Denmark, Sonderborg, Denmark, February 7, 2017.

PUBLICATIONS

Refereed Papers

1. G. Stoll, Jr., R. E. White, J. J. Erhardt, R. I. Masel, and R. P. Merrill, "Scattering of Light Atoms from Strongly Periodic Surfaces," *Journal of Vacuum Science Technology*, 12 (1975), 192–198.
2. Ralph E. White, Jean-Jacques Erhardt, and Robert P. Merrill, "Scattering of Argon and Neon from W(112)," *The Journal of Chemical Physics*, 64 (1976), 41-44.
3. Ralph White, Charles M. Mohr, Jr., and John Newman, "The Fluid Motion Due to a Rotating Disk," *J. of the Electrochemical Society*, 123 (1976), 383–385.

4. Ralph White, James A. Trainham, John Newman, and Thomas W. Chapman, "Potential Selective Deposition of Copper from Chloride Solutions Containing Iron," *J. of the Electrochemical Society*, 124 (1977), 669–676.
5. Ralph White and John Newman, "Simultaneous Reactions on a Rotating-Disk Electrode," *Journal of Electroanalytical Chemistry*, 82 (1977), 173–186.
6. Ralph E. White, "On Newman's Numerical Technique for Solving Boundary Value Problems," *Industrial and Engineering Chemistry Fundamentals*, 17 (1978), 367–369.
7. John Van Zee, Mark Edmund, and Ralph E. White, "Application of Newman's Technique to Solve Coupled, Nonlinear Partial Differential Equations," *Industrial and Engineering Chemistry Fundamentals*, 19 (1980), 438–440.
8. R. E. White, M. Bain, and M. F. Raible, "Parallel Plate Electrochemical Reactor Model," *J. of the Electrochemical Society*, 130(5) (1983), 1037–1042.
9. R. E. White and S. E. Lorimer, "A Model of the Bromine/Bromide Electrode Reaction at a Rotating Disk Electrode," *J. of the Electrochemical Society*, 130 (5) (1983), 1096–1103.
10. R. E. White, S. E. Lorimer, and R. Darby, "Prediction of the Current Density at an Electrode at which Multiple Electrode Reactions Occur Under Potentiostatic Control," *J. of the Electrochemical Society*, 130(5) (1983), 1123–1126.
11. J. Van Zee and R. E. White, "An Analysis of a Back-Fed Porous Electrode for the Br₂/Br Redox Reaction," *J. of the Electrochemical Society*, 130 (1983), 2003–2012.
12. M. Yamana, R. Darby, H. Dhar, and R. E. White, "Electrodeposition of Cobalt Tetraazaanulene Dibromide Oxygen Reduction Catalyst," *Journal of Electroanalytical Chemistry and Interfacial Electrochemistry*, 152/91-2, (1983), 261–268.
13. J. A. Harrison, D. L. Caldwell, and R. E. White, "Electrocatalysts and the Chlorine Evolution Reaction," *Electrochimica Acta*, 28 (1983), 1561–1568.
14. J. A. Harrison, D. L. Caldwell, and R. E. White, "Electrocatalysts and the Chlorine Evolution Reaction Part II: Comparison of Anode Materials," *Electrochimica Acta*, 29 (1984), 203–209.
15. R. E. White, M. A. Nicholson, L. G. Kleine, J. Van Zee and R. Darby, "Extension of Darby's Model of a Hydrophobic Gas-Fed Porous Electrode," *J. of the Electrochemical Society*, 131(2), (1984), 268–275.
16. M. Yamana, R. Darby, and R. E. White, "Preparation of Iron Phthalocyanine Catalyzed Carbon Electrodes by Chemical Modification," *Electrochimica Acta*, 29(3) (1984), 329–331.
17. J. A. Harrison, D. L. Caldwell, and R. E. White, "Electrocatalysis and the Oxygen Evolution Reaction," *Electrochimica Acta*, 29 (1984), 1139–1145.
18. H. P. Dhar, R. E. White, R. Darby, L. R. Cornwell, R. B. Griffin, and G. Burnell, "Corrosion of Cu and Cu:Ni Alloys in 0.5M NaCl and in Synthetic Seawater," *Corrosion*, 41(6) (1985), 317–323.

19. H. P. Dhar, R. Darby, V. Y. Young, and R. E. White, "The Effect of Heat Transfer Atmospheres on the Electrocatalytic Activity of Cobalt Tetraazaanulene: Preliminary Results," *Electrochimica Acta*, 30(4) (1985), 423–429.
20. J. Van Zee and R. White, "Using Parameter Estimation Techniques with a Simple Model of a Diaphragm-Type Electrolyzer to Predict the Energy Cost for NaOH Production," *J. of the Electrochemical Society*, 132 (1985), 818–826.
21. H. P. Dhar, R. E. White, G. Burnell, L. R. Cornwell, R. B. Griffin, and R. Darby, "Corrosion Behavior of 70Cu -30Ni Alloy in 0.5M NaCl and in Synthetic Seawater," *Corrosion*, 41(4) (1985) 193-196.
22. R. E. White, C. W. Walton, D. J. Wolfe, and K. Plowman, "Oxygen Reduction in a Caustic Solution Using a Gas-Fed Porous Electrode," *Chemical Engineering Communications*, 38(3-6) (1985), 229–264.
23. T. V. Nguyen, C. W. Walton, R. E. White, and J. Van Zee, "Parallel Plate Electrochemical Reactor Model: A Method for Determining the Time-Dependent Behavior and the Effects of Axial Diffusion and Axial Migration," *J. of the Electrochemical Society*, 133(1) (1986), 81–87.
24. R. E. White, C. W. Walton, H. S. Burney, and R. N. Beaver, "Predicting Shunt Currents in Stacks of Bipolar Plate Cells," *J. of the Electrochemical Society*, 133(3) (1986), 485–492.
25. J. Van Zee, A. T. Watson, and R. E. White, "Simple Models for Diaphragm-Type Chlorine/Caustic Cells: I. Dynamic Behavior," *J. of the Electrochemical Society*, 133 (1986), 501–507.
26. J. Van Zee, and R. E. White, "Simple Models for Diaphragm-Type Chlorine/Caustic Cells: II. Effect of Acidic Anolyte on Steady-State Caustic Yield," *J. of the Electrochemical Society*, 133 (1986), 508–515.
27. M. Mader, C. W. Walton, and R. E. White, "Parallel Plate Electrochemical Reactor Model: Material Balance Closure and a Simplification," *J. of the Electrochemical Society*, 133 (1986), 1124–1130.
28. T. V. Nguyen, C. W. Walton, and R. E. White, "A Mathematical Model for a Parallel Plate Electrochemical Reactor, CSTR, and Associated Recirculation System," *J. of the Electrochemical Society*, 133 (1986), 1130–1138.
29. M. Mader and R. E. White, "A Mathematical Model of a Zn/Br₂Cell on Charge," *J. of the Electrochemical Society*, 133 (1986), 1297–1307.
30. P. K. Adanuvor, R. E. White, and S. E. Lorimer, "Modeling the Rotating Disk Electrode for Studying the Kinetics of Electrochemical Reactions," *J. of the Electrochemical Society*, 134 (1987), 625–631.
31. T. I. Evans, and R. E. White, "A Mathematical Model of a Zinc/Bromine Flow Cell," *J. of the Electrochemical Society*, 134 (1987), 866–874.
32. P. K. Adanuvor and R. E. White, "Simulation of the Polarization Curves for Oxygen Reduction at a Rotating Disk Electrode," *J. of the Electrochemical Society*, 134 (1987), 1093–1098.

33. P. K. Adanuvor, R. E. White, and S. E. Lorimer, "The Effect of the Tribromide Complex Reaction on the Charge/Discharge Current of the Br_2/Br^- Electrode," *J. of the Electrochemical Society*, 134 (1987), 1450–1454.
34. C. W. Walton and R. E. White, "Utility of an Empirical Method of Modeling Combined Zero Gap/Attached Electrode Membrane Chlor-Alkali Cells," *J. of the Electrochemical Society*, 134 (1987), 565C-574C.
35. T. V. Nguyen and R. E. White, "A Finite Difference Procedure for Solving Coupled, Nonlinear Elliptic Partial Differential Equations," *Computers and Chemical Engineering*, 11 (1987), 543–546.
36. W. E. Ryan, S. L. Kelly, and R. E. White, "A Mathematical Model for the Initial Corrosion Rate of a Porous Layer on a Rotating Disk Electrode," *J. of the Electrochemical Society*, 134 (1987), 2154–2159.
37. T. I. Evans and R. E. White, "A Review of Mathematical Modeling of the Zinc/Bromine Flow Cell and Battery," *J. of the Electrochemical Society*, 134 (1987), 2725–2733.
38. H. Gu, T. V. Nguyen, and R. E. White, "A Mathematical Model for the Lead-Acid Cell: Discharge, Rest, and Charge," *J. of the Electrochemical Society*, 134 (1987), 2953–2960.
39. E. C. Dimpault-Darcy, T. V. Nguyen, and R. E. White, "A Two-Dimensional Mathematical Model of a Porous Lead Dioxide Electrode in a Lead-Acid Cell," *J. of the Electrochemical Society*, 135 (1988), 278–285.
40. E. C. Dimpault-Darcy and R. E. White, "Secondary Current Distributions Using TOPAZ2D and Linear Kinetics," *J. of the Electrochemical Society*, 135 (1988), 656–658.
41. P. K. Adanuvor and R. E. White, "Analysis of Electrokinetic Data by Parameter Estimation and Model Discrimination Techniques," *J. of the Electrochemical Society*, 135 (1988), 1887–1898.
42. Taewhan Yeu, Trung Nguyen, and R. E. White, "A Mathematical Model for Predicting Cyclic Voltammograms of Electronically Conductive Polypyrrole," *J. of the Electrochemical Society*, 135 (1988), 1971–1976.
43. H. S. Burney and R. E. White, "Predicting Shunt Currents in Stacks of Bipolar Plate Cells with Conducting Manifolds," *J. of the Electrochemical Society*, 135 (1988), 1609–1612.
44. S. Chen, K. M. Yin, and R. E. White, "A Mathematical Model for the Electrodeposition of Alloys on a Rotating Disk Electrode," *J. of the Electrochemical Society*, 135 (1988), 2193–2200.
45. Prosper K. Adanuvor and R. E. White, "Oxygen Reduction on Silver in 6.5 Molar Caustic Soda Solution," *J. of the Electrochemical Society*, 135 (1988), 2509–2517.
46. Jose L. Carbajal and R. E. White, "Electrochemical Production and Corrosion Testing of Amorphous Ni-P," *J. of the Electrochemical Society*, 135 (1988), 2952–2957.

47. R. Y. Ying, P. K. Ng, Z. Mao, and R. E. White, "Electrodeposition of Copper-Nickel Alloys from Citrate Solutions of a Rotating Disk Electrode," *J. of the Electrochemical Society*, 135 (1988), 2964–2971.
48. T. I. Evans, T. V. Nguyen, and R. E. White, "A Mathematical Model of Lithium/Thionyl Chloride Primary Cell," *J. of the Electrochemical Society*, 136 (1989), 328–339.
49. J. L. Carbajal, R. E. White, R. B. Griffin, and J. N. Dubrouillet, "Preliminary Investigation on the Corrosion Behavior of Amorphous (Ti₉₀Ru₁₀)₈₇Si in Saline Solutions," *Electrochimica Acta*, 34 (1989), 317–320.
50. T. I. Evans and R. E. White, "A Thermal Analysis of a Spirally Wound Battery Using a Simple Mathematical Model," *J. of the Electrochemical Society*, 136 (1989), 2145–2152.
51. S. J. Ridge, R. E. White, Y.-M. Tsou, R. N. Beaver, and G. A. Eisman, "Oxygen Reduction in a Proton Exchange Membrane Test Cell," *J. of the Electrochemical Society*, 136 (1989), 1902–1909.
52. G. D. Simpson and R. E. White, "An Algebraic Model for a Zinc/Bromine Flow Cell," *J. of the Electrochemical Society*, 136 (1989), 2137–2144.
53. T. I. Evans and R. E. White, "Estimation of Electrode Kinetic Parameters of the Lithium/Thionyl Chloride Cell Using a Mathematical Model," *J. of the Electrochemical Society*, 136 (1989), 2798–2805.
54. D. A. Curtis, T. I. Evans, and R. E. White, "A Comparison of Newman's Numerical Technique and deBoor's Algorithm," *J. of the Electrochemical Society*, 136 (1989), 3392–3393.
55. H. A. Preisig and R. E. White, "On the Design of A Simple Solver for Nonlinear Two-Point Boundary Value Problems," *Computers and Chemical Engineering*, 14 (1990), 179–196.
56. K.-M. Yin and R. E. White, "A Mathematical Model of Pulse Plating on a Rotating Disk Electrode," *AIChE Journal*, 36 (1990), 187–196.
57. F. A. Jagush, R. E. White, and W. E. Ryan, "Predicted Secondary Current Distributions for Linear Kinetics in a Modified Three Dimensional Hull Cell," *J. of the Electrochemical Society*, 137 (1990), 1848–1851.
58. T. Yeu and R. E. White, "Mathematical Model of a Lithium/Polypyrrole Cell," *J. of the Electrochemical Society*, 137 (1990), 1327–1336.
59. G. D. Simpson and R. E. White, "A Simple Model for a Zinc/Bromine Flow Cell and Associated Storage Tanks," *J. of the Electrochemical Society*, 137 (1990), 1843–1846.
60. R. E. White, F. Jagush, and H. S. Burney, "Three Dimensional Current and Potential Distributions in a Bipolar, Chlor-Alkali Membrane Cell," *J. of the Electrochemical Society*, 137 (1990), 1846–1848.
61. Z. Mao, P. Adanuvor, and R. E. White, "Mathematical Modeling of H₂S Removal Electrolyzer," *J. of the Electrochemical Society*, 137 (1990), 2116–2123.

62. Z. Mao, B. Dandapani, A. Anani, S. Srinivasan, R. E. White, and A. J. Appleby, "Electrochemical Behavior of Graphite and Ni-Cr Electrodes in Sodium Polysulfide in the Absence and Presence of Hydrogen Sulfide," *J. of the Electrochemical Society*, 137 (1990), 2189–2194.
63. P. K. Adanuvor, R. E. White, and A. J. Appleby, "A Computer Simulation of the Oxygen Reduction Reaction in Carbonate Melts," *J. of the Electrochemical Society*, 137 (1990), 2095–2103.
64. M. C. Kimble, R. E. White, Yu-Min Tsou, and R. N. Beaver, "Estimation of the Diffusion Coefficient and Solubility for a Gas Diffusing Through a Membrane," *J. of the Electrochemical Society*, 137 (1990), 2510–2514.
65. Michael C. Kimble and Ralph E. White, "A Five-Point Finite Difference Method for Solving Parabolic Partial Differential Equations," *Computers and Chemical Engineering*, 14 (1990), 921–924.
66. A. Anani, Z. Mao, R. White, S. Srinivasan, and A. J. Appleby, "Electrochemical Production of Hydrogen and Sulphur by Low Temperature Decomposition of Hydrogen Sulfide in an Aqueous Alkaline Solution," *J. of the Electrochemical Society*, 137 (1990) 2703–2709.
67. R. E. Fixel and R. E. White, "Ni-Cr-P Plating Bath Analysis by Ion Chromatography," *Journal of the American Electroplaters and Surface Finishers Society*, 77 (1990), 48–53.
68. T. V. Nguyen, R. E. White, and Hiram Gu, "The Effects of Separator Design on the Discharge Performance of a Starved Lead-Acid Cell," *J. of the Electrochemical Society*, 137 (1990) 2998–3004.
69. Oscar Mendoza Gonzalez, Ralph White, and David Cocke, "Autocatalytic Deposition of Ni-TM-P Alloys," *Journal of the American Electroplaters and Surface Finishers Society*, 77 (1990), 63–67.
70. S. Popova, B. Popov, R. White, and D. Drazic, "Determination of Corrosion Properties of Lacquered Tinplate in Citrate Solutions by Electrochemical DC and AC Methods," *Corrosion*, 46 (1990) 1007–1014.
71. Deyuan Fan and Ralph E. White, "A Mathematical Model of a Sealed Nickel-Cadmium Battery," *J. of the Electrochemical Society*, 138 (1991), 17–25.
72. B. B. Dave, R. E. White, S. Srinivasan, and A. J. Appleby, "Electrode Kinetics of Oxygen Reduction in Lithium Carbonate Melt: Use of Impedance Analysis and Cyclic Voltammetric Techniques to Determine the Effects of Partial Pressure of Oxygen," *J. of the Electrochemical Society*, 138 (1991) 673–678.
73. Ken-Ming Yin, Taewhan Yeu, and Ralph White, "A Mathematical Model of Electrochemical Reactions Coupled with Homogeneous Chemical Reactions," *J. of the Electrochemical Society*, 138 (1991) 1051–1054.
74. Z. Mao, A. Anani, R. E. White, S. Srinivasan, and A. J. Appleby, "A Modified Electrochemical Process for the Decomposition of Hydrogen Sulfide in an Aqueous Alkaline Solution," *J. of the Electrochemical Society*, 138 (1991) 1299–1303.

75. B. N. Popov, M. C. Kimble, R. E. White, J. B. Wagner, Jr., and H. Wendt, "Electrochemical Behavior of Titanium (II) and Titanium (III) Compounds in Molten Lithium-Chloride Potassium-Chloride Eutectic Melts," *Journal of Applied Electrochemistry*, 21 (1991) 351–357.
76. Z. Mao, R. E. White, and B. Jay, "Current Distribution in a HORIZON Lead-Acid Battery During Discharge," *J. of the Electrochemical Society*, 138 (1991) 1615–1620.
77. D. Fan and R. E. White, "Modification of Newman's BAND(J) Subroutine to Multi-Region Systems Containing Interior Boundaries: MBAND," *J. of the Electrochemical Society*, 138 (1991) 1688–1691.
78. Egwu E. Kalu and Ralph E. White, "Zn/Br₂ Cell: Effects of Plated Zinc and Complexing Organic Phase," *AIChE Journal*, 37 (1991) 1164-1174.
79. Bhasker B. Dave, Ralph E. White, S. Srinivasan, and A. J. Appleby, "Impedance Analysis for Oxygen Reduction in a Lithium Carbonate Melt," *J. of the Electrochemical Society*, 138 (1991) 2675-2683.
80. R. E. Fixel and R. E. White, "Ni-Cr-P Plating Bath Characterization by Ion Chromatography," *Journal of the American Electroplaters and Surface Finishers Society*, 78 (1991) 76–81, 97.
81. Taewhan Yeu, Ken-Ming Yin, Jose Carbajal, and Ralph E. White, "Electrochemical Characterization of Electronically Conductive Polypyrrole on Cyclic Voltammograms," *J. of the Electrochemical Society*, 138 (1991) 2869–2877.
82. Deyuan Fan and Ralph E. White, "Mathematical Modeling of a Nickel-Cadmium Battery-Effects of Intercalation and Oxygen Reactions," *J. of the Electrochemical Society*, 138 (1991) 2952-2960.
83. Z. Mao and R. E. White, "Mathematical Model of the Self Discharge of a Ni-H₂ Battery," *J. of the Electrochemical Society*, 138 (1991) 3354-3361.
84. B. N. Popov, R. E. White and J. V. Ivshin, "Cementation of Copper from Acidic Sulfate Electrolytes on Nickel Plated Steel," *Journal of the American Electroplaters and Surface Finishers Society*, 78 (1991) 61–65.
85. D. Fan and R. E. White, "Optimization and Extension of Pentadiagonal BAND(J) Solver to Multi-Region Systems Containing Interior Boundaries," *Computers & Chemical Engineering*, 15 (1991) 797-800.
86. E. E. Kalu and R. E. White, "In Situ Degradation of Polyhalogenated Aromatic Hydrocarbons by Electrochemically Generated Superoxide Ions in a Flow-by Porous Electrode," *J. of the Electrochemical Society*, 138 (1991) 3656-3660.
87. Michael C. Kimble and Ralph E. White, "A Mathematical Model of a Hydrogen/Oxygen Alkaline Fuel Cell," *J. of the Electrochemical Society*, 138 (1991) 3370–3382.
88. D. Fan, R. E. White, and N. Gruberger, "Diffusion of a Gas Through a Membrane," *Journal of Applied Electrochemistry*, 22 (1992) 770-772.

89. B. N. Popov, M. C. Kimble, R. E. White, and Z. Koneska, "Anodic Behavior of Titanium in the Presence of Titanium (III) Chloride in Molten Lithium Chloride-Potassium Chloride Eutectic Melts," *Corrosion Science*, 33 (1992) 123–126.
90. B. N. Popov, R. E. White, D. Slavkov and Z. Koneska, "Reduction of Chromium (VI) when Solar Selective Black Chromium is Deposited in the Presence of Organic Additives," *J. of the Electrochemical Society*, 139 (1992) 91-98.
91. Michael C. Kimble and Ralph E. White, "Parameter Sensitivity and Optimization Predictions of a Hydrogen/Oxygen Alkaline Fuel Cell Model," *J. of the Electrochemical Society*, 139 (1992) 478-484.
92. Z. Mao and R. E. White, "Mathematical Modeling of a Primary Zinc/Air Battery," *J. of the Electrochemical Society*, 139 (1992) 1105–1114.
93. Oscar Mendoza, R. E. White, D. L. Cocke and Ben A. Horrell, "Chemical Characterization of Electroless Ni-Mo-P Alloys," *Journal of the American Electroplaters and Surface Finishers Society*, 79 (1992) 51–56.
94. Z. Mao and R. E. White, "The Self Discharge of the NiOOH/Ni(OH)₂ Electrode-Constant Potential Study," *J. of the Electrochemical Society*, 139 (1992) 1282–1289.
95. S. A. McCluney, S. N. Popova, B. N. Popov, R. E. White, R. B. Griffin, "Comparing Electrochemical Impedance Spectroscopy Methods for Estimating the Degree of Delamination of Organic Coatings on Steel," *J. of the Electrochemical Society*, 139 (1992) 1556-1560.
96. R. Bindlish, B. N. Popov and R. E. White, "Electrodeposition of Nickel-Chromium- Phosphorous Alloys in the Presence of Additives," *Journal of the American Electroplaters and Surface Finishers Society*, 79 (1992) 68-73.
97. E. E. Kalu, R. E. White, E. C. Darcy, "Bulk Thermal Capacity Determination for Li/BCX and Li/SOCl₂ Cells," *Journal of Power Sources*, 39 (1992) 193–201.
98. J.-F. Yan, S. N. R. Pakalapati, T. V. Nguyen, R. E. White and R. Griffin, "Mathematical Modeling of Cathodic Protection Using the Boundary Element Method with a Nonlinear Polarization Curve," *J. of the Electrochemical Society*, 139 (1992) 932-1936.
99. Y. Tsou, M. C. Kimble, and R. E. White, "Hydrogen Diffusion, Solubility and Water Uptake in Dow's Short-Side Chain Perfluorocarbon Membranes," *J. of the Electrochemical Society*, 139 (1992) 1913-1917.
100. P. De Vidts and R. E. White, "A Semi-Analytical Solution Method for Linear Partial Differential Equations," *Computers and Chemical Engineering*, 16 (1992) 1007–1009.
101. E. E. Kalu, R. E. White, and E. C. Darcy, "Calorimetric Determination of the Thermoneutral Potential of Li/BCX and Li/SOCl₂ Cells," *J. of the Electrochemical Society*, 139 (1992) 2755–2759.
102. J. Gruberger, Ken-Ming Yin and R. E. White, "A Sulfate Solution for Deposition of Ni-Cr-P Amorphous Alloys," *Surface and Coatings Technology*, 53 (1992) 203–213.

103. E. E. Kalu, R. E. White, and E. C. Darcy, "Measurements of the Fundamental Thermodynamic Parameters of Li/BCX and Li/SOCl₂ Cells," *J. of the Electrochemical Society*, 139 (1992) 2378–2381.
104. Junbom Kim, T. V. Nguyen and R. E. White, "Thermal Mathematical Modeling of a Multicell Common Pressure Vessel Nickel-Hydrogen Battery," *J. of the Electrochemical Society*, 139 (1992) 2781–2787.
105. Junbom Kim and R. E. White, "Comparison of Heat Fin Materials and Design of a Common Pressure Vessel Nickel-Hydrogen Battery," *J. of the Electrochemical Society*, 139 (1992) 3492–3499.
106. Makoto Kawanami, Trung V. Nguyen, and Ralph E. White, "A Mathematical Model of a CuO/Cu "Vaporvolt" Cell," *J. of the Electrochemical Society*, 139 (1992) 3408–3415.
107. B. N. Popov, W. Li, and R. E. White, "A Study of the Stability of Ni-Cr-P Plating Bath Solutions," *Journal of the American Electroplaters and Surface Finishers Society*, 79, No. 11 (1992) 72–78.
108. E. Kalu and R. E. White, "Thermal Analysis of Spirally Wound Li/BCX and Li/SOCl₂ Cells," *J. of the Electrochemical Society*, 140 (1993) 23–31.
109. J. Y. Fan, M. Nikolaou, and R. E. White, "An Approach to Fault Diagnosis of Chemical Processes Via Neural Networks," *AIChE Journal*, 39 No. 1 (1993) 82–88.
110. J.-F. Yan, T. V. Nguyen, R.E. White, and R. B. Griffin, "Mathematical Modeling of the Formation of Calcareous Deposits on Cathodically Protected Steel in Seawater," *J. of the Electrochemical Society*, 140 (1993) 733–742.
111. B. N. Popov, Mohammed A. Alwohaibi, and R. E. White, "Using Electrochemical Impedance Spectroscopy as a Tool for Organic Coating Solute Saturation Monitoring," *J. of the Electrochemical Society*, 140 (1993) 947–951.
112. J.-F. Yan, R. E. White, and R. B. Griffin, "Parametric Studies on the Formation of Calcareous Deposits on Cathodically Protected Steel in Seawater," *J. of the Electrochemical Society*, 140 (1993) 1275–1280.
113. B. N. Popov, Ken-Ming Yin, and R.E. White, "Galvanostatic Pulse and Pulse Reverse Plating of Nickel-Iron Alloys from Electrolytes Containing Organic Compounds on a Rotating Disc Electrode," *J. of the Electrochemical Society*, 140 (1993) 1321–1330.
114. Z. Mao and R.E. White, "A Model for the Deliverable Capacity of the TiS₂ Electrode in a Li/TiS₂ Cell," *Journal of Power Sources*, 43 (1993) 181–191.
115. Bhasker B. Dave, Ralph E. White, S. Srinivasan, and A. J. Appleby, "Impedance Analysis for Oxygen Reduction in a Lithium Carbonate Melt: Effects of Partial Pressure of Carbon Dioxide and Temperature," *J. of the Electrochemical Society*, 140 (1993) 2139–2145.
116. Trung V. Nguyen and Ralph E. White, "A Water and Heat Management Model for Proton-Exchange-Membrane Fuel Cells," *J. of the Electrochemical Society*, 140 (1993) 2178–2186.

117. T. V. Nguyen and R. E. White, "A Mathematical Model of a Hermetically Sealed Lead-Acid Cell," *Electrochimica Acta*, 38 No. 7 (1993) 935–945.
118. Terry R. Guilinger, James E. Voytko, Ralph E. White, and Ken-Ming Yin, "Characterization of Amorphous Ni-Cr-P Electrodeposits," *Journal of the American Electroplaters and Surface Finishers Society*, 80, No. 3 (1993) 69.
119. B. N. Popov, W. Zhang, E. C. Darcy, and R. E. White, "Impedance Spectroscopy as a Nondestructive Health Interrogation Tool for Lithium-BCX Cells," *J. of the Electrochemical Society*, 140 (1993) 3097–3103.
120. G. Zheng, B. N. Popov, and R. E. White, "Surface Treatment for Mitigation of Hydrogen Absorption and Penetration into AISI 4340 Steel," *J. of the Electrochemical Society*, 140 (1993) 3153–3158.
121. Z. Mao, P. De Vidts, R. E. White, and John Newman, "Theoretical Analysis of the Discharge Performance of a Ni/H₂ Cell," *J. of the Electrochemical Society*, 141 (1994) 54–64.
122. Z. Mao and R. E. White, "A Finite Difference Method for Pseudo-Two-Dimensional Boundary Value Problems," *J. of the Electrochemical Society*, 141 (1994) 151–156.
123. B. N. Popov, S. N. Popova, Ken-Ming Yin, and R. E. White, "Electrodeposition of Iron–Nickel Alloys in the Presence of Organic Additives, I. LSV and Potentiostatic Pulse Plating," *Journal of the American Electroplaters and Surface Finishers Society*, (March, 1994) 65.
124. Junbom Kim, T. V. Nguyen and R. E. White, "Thermal Characteristics of a Nickel-Hydrogen Battery," *J. of the Electrochemical Society*, 141 (1994) 333–338.
125. G. Zheng, B. N. Popov, and R. E. White, "Use of Underpotential Deposition of Zinc to Mitigate Hydrogen Absorption into Monel K500," *J. of the Electrochemical Society*, 141 (1994) 1220–1224.
126. G. Zheng, B. N. Popov, and R. E. White, "The Role of Thallium as a Hydrogen Entry Promoter on Cathodically Polarized HY-130 Steel," *J. of the Electrochemical Society*, 141 (1994) 1526–1532.
127. B. N. Popov, G. Zheng, and R. E. White, "Surface Treatment for Inhibition of Corrosion and Hydrogen Penetration of Type 718 Alloy," *Corrosion*, 50, No. 8 (1994) 613-625.
128. B. N. Popov, G. Zheng, and R. E. White, "The Underpotential Deposition of Zinc For Mitigation of Hydrogen Absorption and Penetration into HY-130 Steel," *Corrosion Science*, 36, No. 12, (1994) 2139-2153.
129. G. Zheng, B. N. Popov, and R. E. White, "Hydrogen-Atom Direct-Entry Mechanism into Metal Membranes," *J. of the Electrochemical Society*, 142 (1995) 154-156.
130. D. H. Coleman, R. E. White and D. T. Hobbs, "A Parallel Plate Electrochemical Reactor (PPER) Model for the Destruction of Nitrate and Nitrite in Alkaline Waste Solutions," *J. of the Electrochemical Society*, 142 (1995) 1152-1161.

131. Pauline De Vidts and Ralph E. White, "Mathematical Modeling of a Nickel-Cadmium Cell: Proton Diffusion in the Nickel Electrode," *J. of the Electrochemical Society*, 142 (1995) 1509-1519.
132. G. Zheng, B. N. Popov, and R. E. White, "Surface Treatment for Mitigation of Hydrogen Absorption and Penetration into AISI 4340 Steel and Inconel 718 Alloy," *Journal of Applied Electrochemistry*, 25 (1995) 212-218.
133. J. Landfors, D. Simonsson, R. E. White, "Discharge Behavior of Tubular Lead Dioxide Electrodes III. Two-Dimensional Current Density Distribution," *Journal of Applied Electrochemistry*, 25 (1995) 315-325.
134. B. N. Popov, G. Zheng, and R. E. White, "Electroplating of Thin Films of Bismuth Onto Type 4340 Steel and Alloy 718 to Prevent Hydrogen Embrittlement," *Corrosion Science*, 51, No. 6, (1995) 429-435.
135. G. Zheng, B. N. Popov, and R. E. White, "Electrochemical Determination of the Diffusion Coefficient of Hydrogen through a $\text{LaNi}_{4.25}\text{Al}_{0.75}$ Electrode in Alkaline Aqueous Solution," *J. of the Electrochemical Society*, 142 (1995) 2695-2698.
136. K.-M. Yin, J.-H. Wei, J.-R. Fu, B. N. Popov, S. N. Popova, and R. E. White, "Mass Transport Effects on the Electrodeposition of Iron-Nickel Alloys in the Presence of Additives," *Journal of Applied Electrochemistry*, 25 (1995) 543-555.
137. Pauline De Vidts, Javier Delgado and Ralph E. White, "Mathematical Modeling for the Discharge of a Metal-Hydride Electrode," *J. of the Electrochemical Society*, 142 (1995) 4006-4013.
138. G. Zheng, B. N. Popov, and R. E. White, "Application of Porous Electrode Theory on Metal-Hydride Electrodes in Alkaline Solution," *J. of the Electrochemical Society*, 143 (1996) 435-441.
139. G. Zheng, B. N. Popov, and R. E. White, "Determination of Transport and Electrochemical Kinetic Parameters of Bare and Copper Coated $\text{LaNi}_{4.27}\text{Sn}_{0.24}$ Electrodes in Alkaline Solution," *J. of the Electrochemical Society*, 143 (1996) 834-839.
140. S. N. R. Pakalapati, B. N. Popov, and R. E. White, "Anodic Oxidation of Ethylenediaminetetraacetic Acid on Platinum Electrode in Alkaline Medium," *J. of the Electrochemical Society*, 143 (1996) 1636-1643.
141. D. H. Coleman and R. E. White, "Linear Algebra Used to Determine Independent Half-Cell Equations," *J. of the Electrochemical Society*, 143 (1996) 1781-1783.
142. D. H. Coleman, G. Zheng, B. N. Popov, and R. E. White, "The Effects of Multiple Electroplated Zinc Layers on the Inhibition of Hydrogen Permeation through an Iron Membrane," *J. of the Electrochemical Society*, 143 (1996) 1871-1874.
143. S. N. R. Pakalapati, F. Gadala-Maria, and R. E. White, "Dynamic Mechanical Analysis of a Uniaxial Continuous Carbon Fiber-Thermoplastic Composite Subjected to Anodic and Cathodic Currents," *Polymer Composites*, 17, No. 4 (1996) 620-626.
144. M. Ramasubramanian, S. N. Popova, B. N. Popov, R. E. White and K.-M. Yin, "Anomalous Codeposition of Fe-Ni Alloys and Fe-Ni-SiO₂ Composites Under

- Potentiostatic Conditions” *J. of the Electrochemical Society*, 143 (1996) 2164-2172.
145. B. N. Popov, G. Zheng and R. E. White, “Determination of Transport and Electrochemical Kinetic Parameters of M-H Electrodes,” *Journal of Applied Electrochemistry*, 26 (1996) 603-611.
 146. Douglas B. Meade, Bala S. Haran, and Ralph E. White, “The Shooting Technique for the Solution of Two-Point Boundary Value Problems,” *MapleTech*, 3 (1996) 85-93.
 147. E. E. Kalu, R. E. White, and D. T. Hobbs, “Use of a Hydrogen Anode for Nitrate Waste Destruction,” *J. of the Electrochemical Society*, 143 (1996) 3094-3099.
 148. Pauline De Vidts, Javier Delgado, and Ralph E. White, “A Multiphase Mathematical Model of a Nickel/Hydrogen Cell,” *J. of the Electrochemical Society*, 143 (1996) 3223-3228.
 149. Bala S. Haran and Ralph E. White, “A Semianalytical Technique for Solving Nonlinear Partial Differential Equations,” *Computer Applications in Engineering Education*, Vol. 4 (3) (1996) 229-240.
 150. B. N. Popov, M. Ramasubramanian, S. N. Popova, R. E. White, and K-M. Yin, “Galvanostatic Pulse and Pulse Reverse Plating of Zinc-Nickel Alloys from Sulfate Electrolytes on a Rotating Disc Electrode,” *J. Chem. Soc., Faraday Trans.*, 92 (20)(1996) 4021-4028.
 151. B. S. Haran, B. N. Popov, and R. E. White, “Development of a New Electrokinetic Technique for Decontamination of Hexavalent Chromium from Low Surface Charged Soils,” Part I. Experimental, First Place from the American Institute of Chemical Engineers (B. B.), Environmental Division Paper Competition, *Environmental Progress*, 15, (1996) 166-172.
 152. Pauline De Vidts and Ralph E. White, “Governing Equations for Transport in Porous Electrodes,” *J. of the Electrochemical Society*, 144 (1997) 1343-1353.
 153. Dhanwa Thirumalai and Ralph E. White, “Mathematical Modeling of Proton-Exchange-Membrane Fuel Cell Stacks,” *J. of the Electrochemical Society*, 144 (1997) 1717-1723.
 154. H. A. Duarte, D. M. See, B. N. Popov and R. E. White, “The Effects of Organic Inhibitors on Inhibition of Hydrogen Permeation through an Iron Membrane,” *J. of the Electrochemical Society*, 144 (1997) 2313-2317.
 155. E. Hristova, Lj. Arsov, B. N. Popov, and R. E. White, “Ellipsometric and Raman Spectroscopic Study of Thermally Formed Films on Titanium,” *J. of the Electrochemical Society*, 144 (1997) 2318-2323.
 156. P. Arora, B. N. Popov, B. Haran, M. Ramasubramanian, S. Popova, and R. E. White, “Corrosion Initiation Time of Steel Reinforcement in a Chloride Environment - A One Dimensional Solution,” *Corrosion Science*, 39(4) (1997) 739-759.

157. Dawn M. See and Ralph E. White, "Temperature and Concentration Dependence of the Specific Conductivity of Concentrated Solutions of Potassium Hydroxide," *Journal of Chemical and Engineering Data*, 42 (1997) 1266-1268.
158. G. Zheng, B. N. Popov, and R. E. White, "Effect of Temperature on Performance of $\text{LaNi}_{4.76}\text{SnO}_{0.24}$ Metal Hydride Electrode," *Journal of Applied Electrochemistry*, 27 (1997) 1328-1332.
159. B.S. Haran, B. N. Popov, Guanghong Zheng, and R. E. White, "Mathematical Modeling of Hexavalent Chromium Decontamination from Low Surface Charged Soils," *J. of Hazardous Materials*, 55: (1-3) 93-107 (1997).
160. Bradley A. Johnson and Ralph E. White, "Characterization of Commercially Available Li-ion Batteries," *Journal of Power Sources*, 70 (1998) 48-54.
161. P. Arora, B. N. Popov, and R. E. White, "Electrochemical Investigations of Cobalt Doped LiMn_2O_4 as Cathode Material for Lithium-Ion Batteries," *J. of the Electrochemical Society*, 145 (1998) 807-815.
162. H. A. Duarte, D. M. See, B. N. Popov and R. E. White, "Organic Compounds as Effective Inhibitors for Hydrogen Permeation on Type 1010 Steel," *Corrosion Science*, 54 (1998) 187-193.
163. G. Zheng, B. N. Popov, and R. E. White, "Electrochemical Investigations of Bare and Pd-Coated $\text{LaNi}_{4.25}\text{Al}_{0.75}$ Electrodes in Alkaline Solution," *Journal of Applied Electrochemistry*, 28 (1998) 381-385.
164. Jussi M. Heikonen, Harry J. Ploehn, and Ralph E. White, "The Effect of Particle Size on the Discharge Performance of a Nickel-Metal Hydride Cell," *J. of the Electrochemical Society*, 145 (1998) 1840-1848.
165. P. Arora, Ralph E. White, and Marc Doyle, "Capacity Fade Mechanisms and Side Reactions in Lithium-Ion Batteries," *J. of the Electrochemical Society*, 145 (1998) 3647-3667.
166. Bala S. Haran, Branko N. Popov, and Ralph. E. White, "Determination of the Hydrogen Diffusion Coefficient in Metal Hydrides by Impedance Spectroscopy," *Journal of Power Sources*, 75 (1998) 56-66.
167. P. De Vidts, J. Delgado, B. Wu, D. See, K. Kosanovich, and Ralph E. White, "A Non-isothermal Nickel-Hydrogen Cell Model," *J. of the Electrochemical Society*, 145 (1998) 3874-3883.
168. Bala S. Haran, Branko N. Popov, and Ralph E. White, "Theoretical Analysis of Metal Hydride Electrodes: Studies on Equilibrium Potential and Exchange Current Density," *J. of the Electrochemical Society*, 145 (1998) 4082-4090.
169. S. N. Popova, B. N. Popov, R. E. White, M. F. Petrou, and D. Morris, "Corrosion Effects of Stabilized Backfill on Steel Reinforcement," *American Concrete Institute Structural Journal*, V. 95, No. 5, September-October, 1998 (570-577).
170. M. Ramasubramanian, B. N. Popov, R. E. White, and K.S. Chen, "Solution Equilibrium Characteristics of Electroless Copper Deposition on Thermally-activated Palladium-catalysed Polyimide Substrates," *Journal of Applied Electrochemistry*, 28(1998) 737-743.

171. Dawn M. See and Ralph E. White, "Diaphragm Cell Measurement of Mutual Diffusion Coefficients for Potassium Hydroxide in Water from 1 °C to 25 °C," *Journal of Chemical and Engineering Data*, 43, (1998) 986-988.
172. D. Zhang, B. N. Popov, and R. E. White, "Electrochemical Investigation of CrO_{2.65} Doped LiMn₂O₄ as a Cathode Material for Lithium-ion Batteries," *Journal of Power Sources*, 76 (1998) 81-90.
173. P. Arora, D. Zhang, B. N. Popov and R. E. White, "Chromium Oxides and Lithiated Chromium Oxides-Promising Cathode Materials for Secondary Materials," *Electrochemical and Solid State Letters*, 1, (1998) 249.
174. Bala S. Haran, Branko N. Popov, and Ralph E. White, "Studies on Electroless Cobalt Coatings for Microencapsulation of Hydrogen Storage Alloys," *J. of the Electrochemical Society*, 145 (1998) 3000-3007.
175. M. Ramasubramanian, B. N. Popov, and R. E. White, "Characterization of Hydrogen Permeation through Zinc-Nickel Alloys under Corroding Conditions: Mathematical Model and Experimental Study," *J. of the Electrochemical Society*, 145 (1998)1907-1913.
176. Darryl H. Coleman, Branko N. Popov, and Ralph E. White, "Hydrogen Permeation Inhibition by Thin Layer Zn-Ni Alloy Electrodeposition," *Journal of Applied Electrochemistry*, 28 (1998) 889-894.
177. S. F. Baxter, V. S. Battaglia, and R. E. White, "Methanol Fuel Cell Model: Anode," *J. of the Electrochemical Society*, 146 (1999) 437-447.
178. Dawn M. See and Ralph E. White, "A Simple Method for Determining Differential Diffusion Coefficients from Aqueous Electrolyte Diaphragm Cell Data at Temperatures below 0°C," *J. of the Electrochemical Society*, February, 146 (1999) 677- 679.
179. P. Yu, B. N. Popov, J. A. Ritter and R. E. White, "Determination of the Lithium Ion Diffusion Coefficient in Graphite," *J. of the Electrochemical Society*, 146 (1999) 8-14.
180. M. Ramasubramanian, Branko N. Popov, R. E. White, and K. S. Chen, "A Mathematical Model for Electroless Copper Deposition on Planar Substrates," *J. of the Electrochemical Society*, 146 (1999) 111-116.
181. A. Krishniyer, M. Ramasubramanian, B. N. Popov and R. E. White, "Electrodeposition & Characterization of a Corrosion Resistant Zinc-Nickel-Phosphorous Alloy," *Journal of the American Electroplaters and Surface Finishing Society*, January (1999) 99-103.
182. Gerardine G. Botte, Bradley A. Johnson, and Ralph E. White, "Influence of Some Design Variables on the Thermal Behavior of a Lithium-Ion Cell," *J. of the Electrochemical Society*, 146 (1999) 914-923.
183. Venkat R. Subramanian, Bala S. Haran, and Ralph E. White, "Series Solutions for Boundary Value Problems Using a Symbolic Successive Substitution Method," *Computers & Chemical Engineering*, 23 (1999) 287-296.

184. Yuanwu Xie, Branko N. Popov, and Ralph E. White, "A Novel Electrochemical Method for the Detection of Nerve Gas," *Journal of Electroanalytical Chemistry*, 466 (1999) 169-176.
185. G. Zheng, B.S. Haran, B. N. Popov, and R. E. White, "Studies on Metal Hydride Electrodes with Different Weights and Binder Contents," *Journal of Applied Electrochemistry*, 29 (1999) 361-369.
186. Anand Durairajan, Bala S. Haran, Branko N. Popov and Ralph E. White, "Cycle Life and Utilization Studies on Cobalt Microencapsulated AB₅ type Metal Hydride," *Journal of Power Sources*, (1999) 114-120.
187. Dong Zhang, Branko N. Popov, Yury M. Podrazhansky, Pankaj Arora and Ralph E. White, "Cobalt Doped Chromium Oxides as Cathode Materials for Secondary Lithium Batteries," *Journal of Power Sources*, (1999) 121-127.
188. Chuan Lin, James A. Ritter, Branko N. Popov, and Ralph E. White, "A Mathematical Model of an Electrochemical Capacitor with Double-Layer and Faradaic Processes," *J. of the Electrochemical Society*, 146 (1999) 3168-3175.
189. Pankaj Arora, Marc Doyle and Ralph E. White, "Mathematical Modeling of the Lithium Deposition Overcharge Reaction in Lithium-Ion Batteries using Carbon-Based Negative Electrodes," *J. of the Electrochemical Society*, 146 (1999) 3543-3553.
190. Andrew T. Haug and Ralph E. White, "Oxygen Diffusion Coefficient and Solubility in a New Proton Exchange Membrane," *J. of the Electrochemical Society*, 147 (2000) 980-983. [PDF](#)
191. A. Durairajan, A. Krishniyer, B.S. Haran, R. E. White, and B.N. Popov, "Characterization of Hydrogen Permeation Through a Corrosion-Resistant Zinc-Nickel-Phosphorus Alloy," *Corrosion* (Houston), Vol. 56, No. 3 (March, 2000) 283-288. [PDF](#)
192. Dong Zhang, Branko N. Popov, and Ralph E. White, "Modeling Lithium Intercalation of a Single Spinel Particle under Potentiodynamic Control," *J. of the Electrochemical Society*, 147 (2000) 831-838. [PDF](#)
193. B. Wu and R. E. White, "Self-Discharge Model of a Nickel-Hydrogen Cell," *J. of the Electrochemical Society*, 147 (2000) 902-909. [PDF](#)
194. Changqing Lin, Ralph E. White, and Harry J. Ploehn, "Modeling the Effects of Ion Association on Direct-Current Polarization of Solid Polymer Electrolytes," *J. of the Electrochemical Society*, 147 (2000) 936-941. [PDF](#)
195. P. Yu, J. A. Ritter, R. E. White, and B. N. Popov, "Ni-Composite Microencapsulated Graphite as the Negative Electrode in Li-Ion Batteries, I. Initial Irreversible Capacity Study," *J. of the Electrochemical Society*, 147 (2000) 1280-1285. [PDF](#)
196. Dhanwa Thirumalai and Ralph E. White, "Steady-State Operation of a Compressor for a Proton Exchange Membrane Fuel Cell System," *Journal of Applied Electrochemistry*, 30 (2000) 551-560. [PDF](#)

197. Venkat R. Subramanian and Ralph E. White, "A Semi-analytical Method for Predicting Primary and Secondary Current Density Distributions: Linear and Non-linear Boundary Conditions," *J. of the Electrochemical Society*, 147 (2000) 1636-1644. [PDF](#)
198. Gerardine G. Botte, Venkat R. Subramanian and Ralph E. White, "Mathematical Modeling of Secondary Lithium Batteries," *Electrochimica Acta*, (50th Anniversary Special Issue), 45, (2000) 2595-2609. [PDF](#)
199. P. Yu, J. A. Ritter, R. E. White, and B. N. Popov, "Ni-Composite Microencapsulated Graphite as the Negative Electrode in Li-Ion Batteries, II Electrochemical Impedance and Self-Discharge Studies," *J. of the Electrochemical Society*, 147 (2000) 2081-2085. [PDF](#)
200. Pankaj Arora, Marc Doyle, Antoni S. Gozdz, Ralph E. White, and John Newman, "Comparison between Computer Simulations and Experimental Data for High-Rate Discharges of Plastic Lithium-Ion Batteries," *Journal of Power Sources*, 88 (2000) 219-231. [PDF](#)
201. Venkat R. Subramanian, Harry J. Ploehn, and R. E. White, "Shrinking Core Model for the Discharge of a Metal Hydride Electrode," *J. of the Electrochemical Society*, 147 (2000) 2868-2873. [PDF](#)
202. Bala S. Haran, Branko N. Popov, Michael F. Petrou and Ralph E. White, "Studies on Galvanized Carbon Steel in Ca(OH)₂ Solutions," *ACI Materials Journal*, V. 97 No. 4 (2000) 425-431. [PDF](#)
203. Anand Durairajan, Bala S. Haran, Ralph E. White, and Branko N. Popov, "Pulverization and Corrosion Studies of Bare and Cobalt-Encapsulated Metal Hydride Electrodes," *Journal of Power Sources*, 87 (2000) 84-91. [PDF](#)
204. Anand Durairajan, Bala S. Haran, Ralph E. White and Branko N. Popov, "Development of a Novel Electrodeposition Process for Plating of Zn-Ni-X (X=Cd, P) Alloys Part I: Corrosion Characteristics of Zn-Ni-Cd Ternary Alloys," *J. of the Electrochemical Society*, 147 (2000) 1781-1786. [PDF](#)
205. Venkat Srinivasan, John W. Weidner, and Ralph E. White, "Mathematical Models of the Nickel Hydroxide Active Material," *J. of Solid State Electrochemistry*, (2000) 4: 367-382. [PDF](#)
206. Ralph E. White and Venkat R. Subramanian, "Mathematical Modeling of Electrodeposition," *Plating & Surface Finishing*, (September, 2000) Vol. 87, 42-45.
207. Ping Yu, Bala S. Haran, James A. Ritter, Ralph E. White, and Branko N. Popov, "Palladium-microencapsulated graphite as the negative electrode in Li-ion cells," *Journal of Power Sources*, 91 (2000) 107-117. [PDF](#)
208. D. Zhang, B. S. Haran, A. Durairajan, R. E. White, Y. Podrazhansky, and B. N. Popov, "Studies on capacity fade of lithium-ion batteries," *Journal of Power Sources*, 91 (2000) 122-129. [PDF](#)
209. Venkat R. Subramanian and Ralph E. White, "Solving Differential Equations with Maple," *Chemical Engineering Education*, (2000), 328-336. [PDF](#)

210. Venkat R. Subramanian and Ralph E. White, "Symbolic Solutions for Boundary Value Problems using Maple," *Computers and Chemical Engineering*, 24 (2000), 2405-2416. [PDF](#)
211. Anand Durairajan, Branko N. Popov, Bala S. Haran, and Ralph E. White, "Development of a New Electrodeposition Process for Plating of Zn-Ni-X (X = Cd, P) Alloys, Part II: Permeation Characteristics of Zn-Ni-Cd Ternary Alloys," *J. of the Electrochemical Society*, 147 (2000), 4507-4511. [PDF](#)
212. Gerardine G. Botte, James A. Ritter and Ralph E. White, "Comparison of Finite Difference and Control Volume Methods for Solving Differential Equations," *Computers and Chemical Engineering*, 24 (2000), 2633-2654. [PDF](#)
213. B. Wu and R. E. White, "A Procedure for Serial Simulation of Electrochemical Processes: Cycling of Electrodes and Batteries," *Journal of Power Sources*, 92 (2001), 177-186. [PDF](#)
214. Gerardine G. Botte and Ralph E. White, "Modeling Lithium Intercalation in a Porous Carbon Electrode," *J. of the Electrochemical Society*, 148 (2001), A54-A56. [PDF](#)
215. Manikandan Ramani, Bala S. Haran, Ralph E. White and Branko N. Popov, "Synthesis and Characterization of Hydrous Ruthenium Oxide-Carbon Supercapacitors," *J. of the Electrochemical Society*, 148(4)(2001), A374-A380. [PDF](#)
216. B. Wu, R. Dougal, and R. E. White, "Resistive Companion Battery Modeling for Electric Circuit Simulations," *Journal of Power Sources*, 93 (2001), 186-200. [PDF](#)
217. Gerardine G. Botte, Ralph E. White, and Zhengming Zhang, "Thermal Stability of LiPF₆-EC:EMC Electrolyte for Lithium Ion Batteries," *Journal of Power Sources*, 97-98 (2001), 570-575. [PDF](#)
218. B. Wu and R. E. White, "An Initialization Subroutine for DAEs Solvers: DAEIS," *Computers & Chemical Engineering*, 25 (2001), 301-311. [PDF](#)
219. Venkat R. Subramanian and Ralph E. White, "New Separation of Variables Method for Composite Electrodes with Galvanostatic Boundary Conditions," *Journal of Power Sources*, 96 (2) (2001), 385-395. [PDF](#)
220. Venkat R. Subramanian, Ping Yu, Branko N. Popov and Ralph E. White, "Modeling Lithium Diffusion in Nickel Composite Graphite," *Journal of Power Sources*, 96 (2) (2001), 396-405. [PDF](#)
221. B. Wu and R. E. White, "Modeling of a Nickel-Hydrogen Cell. Phase Reactions in Nickel Active Material," *J. of the Electrochemical Society*, 148 (6) A595-A609 (2001). [PDF](#)
222. M. Ramasubramanian, B. S. Haran, Snezana Popova, Branko N. Popov, Michael F. Petrou, and Ralph E. White, "Inhibiting Action of Calcium Nitrite on Carbon Steel Rebars," *J. Mater. Civil Eng.*, 13 (1) 10-17 (2001). [PDF](#)

223. Manikandan Ramani, Bala S. Haran, Ralph E. White and Branko N. Popov, "Studies on Activated Carbon Capacitor Loaded with Different Amounts of Ruthenium Oxide," *Journal of Power Sources*, 93 (1-2) (2001) 209-214. [PDF](#)
224. Balaji Krishnamurthy, Ralph E. White, and Harry J. Ploehn, "Non-equilibrium Point Defect Model for Time-dependent Passivation of Metal Surfaces," *Electrochimica Acta* 46 (2001) 3387-3396. [PDF](#)
225. Venkat R. Subramanian, James A. Ritter, and Ralph E. White, "Approximate Solutions for Galvanostatic Discharge of Spherical Particles – 1. Constant Diffusion Coefficient," *J. of the Electrochemical Society*, 148 (11) E444-E449 (2001). [PDF](#)
226. B. Wu, M. Mohammed, D. Brigham, R. Elder, and R. E. White, "A Non-Isothermal Model of a Nickel-Metal Hydride Cell," *Journal of Power Sources*, 101 (2) (2001) 149-157. [PDF](#)
227. Ramadass Premanand, Anand Durairajan, Bala Haran, Ralph White and Branko Popov, "Studies on Capacity Fade of Spinel-Based Li-Ion Batteries," *J. of the Electrochemical Society*, 149 (1) A54-A60 (2002). [PDF](#)
228. Andrew T. Haug, Ralph E. White, John W. Weidner, Wayne Huang, Steven Shi, Timothy Stoner, and Narender Rana, "Increasing Proton Exchange Membrane Fuel Cell Catalyst Effectiveness Through Sputter Deposition," *J. of the Electrochemical Society*, 149 (3) A280-A287 (2002). [PDF](#)
229. Anand Durairajan, Hector Colon-Mercado, Bala Haran, Ralph White and Branko Popov, "Electrochemical Characterization of Cobalt-encapsulated Nickel as Cathodes for MCFC," *Journal of Power Sources*, 104 (2) (2002) 157-168. [PDF](#)
230. Qingzhi Guo, Venkat R. Subramanian, John W. Weidner, and Ralph E. White, "Estimation of Diffusion Coefficient of Lithium in Carbon Using AC Impedance Technique," *J. of the Electrochemical Society*, 149 (3) A307-A318(2002). [PDF](#)
231. R. A. Dougal, S. Liu and R. E. White, "Power and Life Extension of Battery-Ultracapacitor Hybrids," *IEEE Transactions on Components and Packaging Technologies*, Vol. 25, No. 1, pp. 120-131, March 2002. [PDF](#)
232. Tianping Duan, John W. Weidner, and Ralph E. White, "Extension of Newman's Method to Electrochemical Reaction-Diffusion in a Fuel Cell Catalyst Layer," *Journal of Power Sources*, 107 (1), 24-33, 2002. [PDF](#)
233. C. E. Holland, J. W. Weidner, R. A. Dougal, and R. E. White, "Experimental Characterization of Hybrid Power Systems Under Pulse Current Loads," *Journal of Power Sources*, 109 (1), 32-37, 2002. [PDF](#)
234. Andrew T. Haug, Ralph E. White, John W. Weidner, Wayne Huang, Steven Shi, Narender Rana, Stephan Grunow, Timothy C. Stoner, and Alain E. Kaloyeros, "Using Sputter Deposition to Increase CO Tolerance in a Proton-Exchange Membrane Fuel Cell," *J. of the Electrochemical Society*, 149 (7) A868-A872 (2002). [PDF](#)

235. Andrew T. Haug, Ralph E. White, John W. Weidner, and Wayne Huang, "Development of a Novel CO Tolerant Proton Exchange Membrane Fuel Cell Anode," *J. of the Electrochemical Society*, 149 (7) A862-A867 (2002). [PDF](#)
236. Balaji Krishnamurthy, Ralph E. White, and Harry J. Ploehn, "Electric Field Strength Effects on Time-Dependent Passivation of Metal Surfaces," *Electrochimica Acta*, 47(15), 2505-2513 (2002). [PDF](#)
237. Changqing Lin, Ralph E. White and Harry J. Ploehn, "Modeling the Effects of Ion Association on Alternating Current Impedance of Solid Polymer Electrolytes," *J. of the Electrochemical Society*, 149 (7) E242-E251 (2002). [PDF](#)
238. Balaji Krishnamurthy, Ralph E. White, and Harry J. Ploehn, "Simplified Point Defect Model for Growth of Anodic Passive Films on Iron," *Electrochimica Acta*, (2002), 47(20), 3375-3381. [PDF](#)
239. Prabhu Ganesan, Hector Colon, Bala Haran, Ralph White, and Branko N. Popov, "Study of cobalt-doped lithium nickel oxides as cathodes for MCFC," *Journal of Power Sources*, 111 (1) (2002), 109-120. [PDF](#)
240. P. Ramadass, Bala Haran, Ralph White, and Branko N. Popov, "Performance study of commercial LiCoO₂ and spinel-based Li-ion cells," *Journal of Power Sources*, 111 (2) (2002), 210-220. [PDF](#)
241. Venkat R. Subramanian and Ralph E. White, "Simulating Shape Changes during Electrodeposition: Primary and Secondary Current Distribution," *J. of the Electrochemical Society*, 149(10), C498-C505 (2002). [PDF](#)
242. Parthasarathy M. Gomadam, John W. Weidner, Roger A. Dougal, Ralph E. White, "Mathematical modeling of lithium-ion and nickel battery systems," *Journal of Power Sources* (2002), 110(2), 267-284. [PDF](#)
243. P. Ramadass, Bala Haran, Ralph White, and Branko N. Popov, "Capacity fade of Sony 18650 cells cycled at elevated temperatures. Part I. Cycling performance," *Journal of Power Sources* (2002), 112(2), 606-613. [PDF](#)
244. P. Ramadass, Bala Haran, Ralph White, and Branko N. Popov, "Capacity fade of Sony 18650 cells cycled at elevated temperatures. Part II. Capacity fade analysis," *Journal of Power Sources* (2002), 112(2), 614-620. [PDF](#)
245. N. Subramanian, B. S. Haran, P. Ganesan, R. E. White, and B. N. Popov, "Analysis of Molten Carbonate Fuel Cell Performance Using a Three-Phase Homogeneous Model," *J. of the Electrochemical Society*, 150(1), A46-A56, 2003. [PDF](#)
246. G. Sikha, P. Ramadass, B. S. Haran, R. E. White, and Branko N. Popov, "Comparison of the Capacity Fade of Sony US 18650 Cells Charged with Different Protocols," *J. Power Sources*, (2003) 122(1), 67-76. [PDF](#)
247. P. Ramadass, Bala Haran, Ralph White and Branko N. Popov, "Mathematical modeling of the capacity fade of Li-ion cells," *Journal of Power Sources*, Vol. 123 (2003), 230-240. [PDF](#)

248. Parthasarathy M. Gomadam, John W. Weidner, and Ralph E. White, "Modeling Heat Conduction in Spiral Geometries," *J. of the Electrochemical Society*, 150 (10), A1339-A1345, (2003) [PDF](#)
249. Nalini Subramanian, B. S. Haran, R. E. White, and Branko N. Popov, "Full Cell Mathematical Model of a MCFC," *J. of the Electrochemical Society*, 150 (10), A1360-A1367 (2003). [PDF](#)
250. Qingzhi Guo, Maria Cayetana, Yu-min Tsou, Emory S. De Castro, and Ralph E. White, "Study of Ionic Conductivity Profiles of the Air Cathode of a PEMFC by AC Impedance Spectroscopy." *J. of the Electrochemical Society*, 150(11), A1440- A1449 (2003). [PDF](#)
251. P. Ramadass, Parthasarathy M. Gomadam, Ralph White and Branko N. Popov, "Development of First Principles Capacity Fade Model for Li-Ion Cells," *J. of the Electrochemical Society*, 151(2). A196-A203 (2004). [PDF](#)
252. Bin Wu and R. E. White, "One Implementation Variant of the Finite Difference Method for Solving ODEs/DAEs," *Computers & Chemical Engineering*, 28(3), 303-309 (2004). [PDF](#)
253. Harry J. Ploehn, Premanand Ramadass, and Ralph E. White, "Solvent Diffusion Model for Aging of Lithium-Ion Battery Cells," *J. of the Electrochemical Society*, 151(3), A456-A462 (2004). [PDF](#)
254. Venkat R. Subramanian and Ralph E. White, "Semianalytical method of lines for solving elliptic partial differential equations," *Chemical Engineering Science*, 59(4), 781-788 (2004). [PDF](#)
255. Qingzhi Guo and Ralph E. White, "A Steady-State Impedance Model for a PEMFC Cathode," *J. of the Electrochemical Society*, 151(4), E133-E149 (2004). [PDF](#)
256. Sheba Devan, Venkat R. Subramanian, and R. E. White, "Analytical Solution for the Impedance of a Porous Electrode," *J. of the Electrochemical Society*, 151(6), A905-A913 (2004). [PDF](#)
257. Qingzhi Guo, Vijay A. Sethuraman, and Ralph E. White, "Parameter Estimates for a PEMFC Cathode," *J. of the Electrochemical Society*, 151(7), A983-A993 (2004). [PDF](#)
258. Godfrey Sikha, Branko N. Popov, and Ralph E. White, "Effect of Porosity on the Capacity Fade of a Lithium-Ion Battery: Theory," *J. of the Electrochemical Society*, 151(7), A1104-A1114 (2004). [PDF](#) .
259. Shriram Santhanagopalan and Ralph E. White, "Series Solution to the Transient Convective Diffusion Equation for a Rotating Disk Electrode," *J. of the Electrochemical Society*, 151(8), J50-J53 (2004). [PDF](#)
260. Venkat R. Subramanian, Deepak Tapriyal, and Ralph E. White, "A Boundary Condition for Porous Electrodes," *Electrochemical and Solid-State Letters*, 7(9), A259-A263 (2004). [PDF](#)

261. Venkat R. Subramanian, Sheba Devan, and Ralph E. White, "An Approximate Solution for a Pseudocapacitor," *Journal of Power Sources*, 135(1-2), 361-367 (2004). [PDF](#)
262. Brenda L. Garcia, Vijay A. Sethuraman, John W. Weidner, and Ralph E. White, and Roger Dougal, "Mathematical Model of a Direct Methanol Fuel Cell," *International Journal of Fuel Cell Science and Technology*, 1(1), 43-48 (2004). [PDF](#)
263. Ramaraja P. Ramasamy, Ralph E. White and Branko N. Popov, "Calendar Life Performance of Pouch Lithium-ion Cells," *Journal of Power Sources*, 141(2), 298-306, (2005). [PDF](#)
264. Qi Zhang, Qingzhi Guo, Shengyi Liu, Roger A. Dougal, and Ralph E. White, "Resistive Companion Modeling of Batteries in Virtual Test Bed," *Journal of Power Sources*, 141(2), 359-368 (2005). [PDF](#)
265. Qingzhi Guo and Ralph E. White, "Cubic Spline Regression for the Open-Circuit Potential of a Lithium-Ion Battery," *J. of the Electrochemical Society*, 152((2), A343-A350, (2005). [PDF](#)
266. Sheba Devan, Venkat R. Subramanian, and Ralph E. White, "Transient Analysis of a Porous Electrode," *J. of the Electrochemical Society*, 152 (5), A947-A955, (2005). [PDF](#)
267. Godfrey Sikha, Ralph E. White, and Branko N. Popov, "A Mathematical Model for a Lithium-Ion Battery/Electrochemical Capacitor Hybrid System," *J. of the Electrochemical Society*, 152 (8), A1682-A1693, (2005). [PDF](#)
268. Andrew T. Stamps, Charles E. Holland, Ralph E. White, and Edward P. Gatzke, "Analysis of Capacity Fade in a Lithium Ion Battery," *Journal of Power Sources*, 150, 229-239 (2005). [PDF](#)
269. Gang Ning, Ralph E. White, and Branko N. Popov, "A Generalized Cycle Life Model of Rechargeable Li-ion Batteries," *Electrochimica Acta*, 51(10), 2012-2022 (2006). [PDF](#)
270. Qi Zhang, Qingzhi Guo, and Ralph E. White, "A New Kinetic Equation for Intercalation Electrodes," *J. of the Electrochemical Society*, 153(2), A301-A309 (2006). [PDF](#)
271. Shriram Santhanagopalan, Qingzhi Guo, Premanand Ramadass, and Ralph E. White, "Review of Models for Predicting the Cycling Performance of Lithium Ion Batteries," *Journal of Power Sources*, 156 (2), 620-628 (2006). [PDF](#)
272. Karthikeyan Kumaresan, Qingzhi Guo, Premanand Ramadass, and Ralph E. White, "Cycle Life Performance of Lithium-ion Pouch Cells," *Journal of Power Sources*, 158 (1), 679-688 (2006). [PDF](#)
273. Sindhuja Renganthan, Qingzhi Guo, Vijay A. Sethuraman, John W. Weidner, and Ralph E. White, "Polymer Electrolyte Membrane Resistance Model," *Journal of Power Sources*, 160 (1), 386-397 (2006). [PDF](#)

274. Shriram Santhanagopalan and Ralph E. White, "Online Estimation of the State of Charge of a Lithium Ion Cell," *Journal of Power Sources*, 161 (2), 1346-1355 (2006). [PDF](#)
275. Godfrey Sikha and Ralph E. White, "Analytical Expression for the Impedance Response of an Insertion Electrode Cell," *J. of the Electrochemical Society*, 154 (1), A43-A54 (2007). [PDF](#)
276. Sheba Devan and Ralph E. White, "Short-Time Transient Analysis of Intercalation of an Ion into a Sphere," *J. of the Electrochemical Society*, 154(3), A242-A252, (2007). [PDF](#)
277. Qi Zhang, Qingzhi Guo, and Ralph E. White, "Semi-empirical Modeling of Charge and Discharge Profiles for a LiCoO₂ Electrode," *Journal of Power Sources*, 165(1), 427-435 (2007). [PDF](#)
278. Shriram Santhanagopalan, Qingzhi Guo, and Ralph E. White, "Parameter Estimation and Model Discrimination for a Lithium-Ion Cell," *J. of the Electrochemical Society*, 154(3), A198-A206 (2007). [PDF](#)
279. Qi Zhang and Ralph E. White, "Comparison of Approximate Solution Methods for the Solid Phase Diffusion Equation in a Porous Electrode Model," *Journal of Power Sources*, 165(2), 880-886 (2007). [PDF](#)
280. Qi Zhang and Ralph E. White, "Moving Boundary Model for the Discharge of a LiCoO₂ Electrode," *J. of the Electrochemical Society*, 154(6), A587-A596 (2007). [PDF](#)
281. Qingbo Dong, Shriram Santhanagopalan, and Ralph E. White, "Simulation of Polarization Curves for Oxygen Reduction Reaction in 0.5 M H₂SO₄ at a Rotating Ring Disk Electrode," *J. of the Electrochemical Society*, 154(8), A816-A825 (2007). [PDF](#)
282. Qingbo Dong, Shriram Santhanagopalan, and Ralph E. White, "Simulation of the Oxygen Reduction Reaction at an RDE in 0.5 M H₂SO₄ including an Adsorption Mechanism," *J. of the Electrochemical Society*, 154(9)A888-A899 (2007). [PDF](#)
283. Qi Zhang and Ralph E. White, "Calendar Life Study of Li-ion Pouch Cells," *Journal of Power Sources*, 173(2), 990-997 (2007). [PDF](#)
284. Karthikeyan Kumaresan, Godfrey Sikha, and Ralph E. White, "Thermal Model for a Li-Ion Cell," *J. of the Electrochemical Society*, 155(2), A164-A171 (2008). [PDF](#)
285. Shriram Santhanagopalan, Qi Zhang, Karthikeyan Kumaresan, and Ralph E. White, "Parameter Estimation and Life Modeling of Lithium-Ion Cells," *Journal of the Electrochemical Society*, 155(4), A345-A353, (2008). [PDF](#)
286. Qi Zhang and Ralph E. White, "Calendar Life Study of Li-Ion Pouch Cells: Part 2: Simulation," *Journal of Power Sources*, 179(2), 785-792, (2008). [PDF](#)
287. Qi Zhang and Ralph E. White, "Capacity Fade Analysis of a Lithium Ion Cell," *Journal of Power Sources*, 179 (2), 793-798, (2008). [PDF](#)
288. Karthikeyan Kumaresan, Yuriy Mikhaylik, and Ralph E. White, "A Mathematical Model for a Lithium-Sulfur Cell," *Journal of the Electrochemical Society*, 155(8), A576-A582,(2008). [PDF](#)

289. Qingbo Dong, Shriram Santhanagopalan, and Ralph E. White, "A Comparison of Numerical Solutions for the Fluid Motion Generated by a Rotating Disk Electrode," *Journal of the Electrochemical Society*, 155(9), B963-B969, (2008). [PDF](#)
290. Godfrey Sikha and Ralph E. White, "Analytical Expression for the Impedance Response for a Lithium-Ion Cell," *Journal of the Electrochemical Society*, 155(12), A893-A902 (2008). [PDF](#)
291. Deepak K. Karthikeyan, Godfrey Sikha, and Ralph E. White, "Thermodynamic Model Development for Lithium Intercalation Electrodes," *Journal of Power Sources*, 185(2), 1398-1406 (2008). [PDF](#)
292. Long Cai and Ralph E. White, "Reduction of Model Order Based on Proper Orthogonal Decomposition for Lithium-Ion Battery Simulations," *Journal of the Electrochemical Society*, 156(3), A154-A161 (2009). [PDF](#)
293. Sean Rayman and Ralph E. White, "Simulation of Reduction of Cr(VI) by Fe (II) Produced Electrochemically in a Parallel-Plate Electrochemical Reactor," *Journal of the Electrochemical Society*, 156(6), E96-E104 (2009). [PDF](#)
294. Sindhuja Renganathan, Godfrey Sikha, Shriram Santhanagopalan, and Ralph E. White, "Theoretical Analysis of Stresses in a Lithium ion Cell," *Journal of the Electrochemical Society*, 157(2), A155-A163 (2010). [PDF](#)
295. Shriram Santhanagopalan and Ralph E. White, "State of Charge Estimation using an Unscented Filter for High Power Lithium Ion Cells," *International Journal of Energy Research*, 34(2), 152-163 (2010).
296. Saeed Khaleghi Rahimian, Sean C. Rayman, and Ralph E. White, "Maximizing the Life of a Lithium-Ion Cell by Optimization of Charging Rates," *Journal of the Electrochemical Society*, 157(12) A1302-A1308 (2010.). <http://dx.doi.org/10.1149/1.3491367>
297. Long Cai and Ralph E. White, "An Efficient Electrochemical-Thermal Model for a Lithium-Ion Cell by Using the Proper Orthogonal Decomposition Method," *Journal of the Electrochemical Society*, 157(11), A1188-A1195 (2010). <http://dx.doi.org/10.1149/1.3486082>
298. Sindhuja Renganathan and Ralph E. White, "Semianalytical Method of Solution for Solid Phase Diffusion in Lithium Ion Battery Electrodes: Variable Diffusion Coefficient," *Journal of Power Sources*, 196(1), 442-448 (2011). <http://dx.doi.org/10.1016/j.jpowsour.2010.06.081>
299. Saeed Khaleghi Rahimian, Farhang Jalali, J. D. Seader, and R. E. White, and J. D. Seader, "A New Homotopy for Seeking All Real Roots of a Nonlinear Equation." *Computers & Chemical Engineering*, 35(3), 403-411(2011). <http://dx.doi.org/10.1016/j.compchemeng.2010.04.007>
300. Meng Guo, Godfrey Sikha, and Ralph E. White, "Single-Particle Model for a Lithium-Ion Cell: Thermal Behavior," *Journal of the Electrochemical Society*, 158(2), A122-A132 (2011). <http://dx.doi.org/10.1149/1.3521314>

301. Saeed Khaleghi Rahimian, Farhang Jalali, J. D. Seader, and R. E. White, "A Robust Homotopy Continuation Method for Seeking all Real Roots of Unconstrained Systems of Nonlinear Algebraic and Transcendental Equations," *Industrial & Engineering Chemistry Research*, 50(15) 8892-8900 (2011).
10.1021/ie101966b
302. Long Cai and Ralph E. White, "Mathematical Modeling of a Lithium Ion Battery with thermal effects in COMSOL Inc. Multiphysics (MP) Software," *Journal of Power Sources*, 196(14), 5985-5989 (2011).
<http://dx.doi.org/10.1016/j.jpowsour.2011.03.017>
303. Saeed Khaleghi Rahimian, Sean Rayman, and Ralph E. White, "Comparison of Single Particle and Equivalent Circuit Analog Models for a Lithium-Ion Cell," *Journal of Power Sources*, 196, 20, 8450-8462 (2011).
<http://dx.doi.org/10.1016/j.jpowsour.2011.06.007>
304. Meng Guo and Ralph E. White, "Thermal Model for Lithium Ion Battery Pack with Mixed Parallel and Series Configuration, *Journal of the Electrochemical Society*, 158 (10), A1166-A1176 (2011). <http://dx.doi.org/10.1149/1.3624836>
305. Derek A. Strange, Sean Rayman, Jesse S. Shaffer, and Ralph E. White, "Physics-based Lithium Ion Silver Vanadium Cathode Model," *Journal of Power Sources*, 196 (22). 9708-9718 (2011). <http://dx.doi.org/10.1016/j.jpowsour.2011.07.057>
306. Saeed Khaleghi Rahimian, Sean Rayman, and Ralph E. White, "Optimal Charge Rates for a Lithium Ion Cell, *Journal of Power Sources*, 196 (23) 10297-10304 (2011). <http://dx.doi.org/10.1016/j.jpowsour.2011.07.019>
307. Meng Guo and Ralph E. White, "An Approximate Solution for Solid-Phase Diffusion in Physics-Based Li-ion Cell Models," *Journal of Power Sources*, 198, January, 322-328 (2011). <http://dx.doi.org/10.1016/j.jpowsour.2011.08.096>
308. Tingting Yang, Long Cai, and Ralph E. White, "Mathematical Modeling of the LiAl/FeS₂ High Temperature Battery System," *Journal of Power Sources*, 201, March, 322-331 (2012). <http://dx.doi.org/10.1016/j.jpowsour.2011.11.006>
309. Shriram Santhanagopalan and Ralph E. White, "Quantifying Cell-to-Cell Variations in Lithium Ion Batteries," *International Journal of Electrochemistry*, Vol. 2012, Article ID395838, 10 pages, (2012)
<http://www.hindawi.com/journals/ijelc/2012/395838/>.
310. Saeed Khaleghi Rahimian, Sean Rayman, and Ralph E. White, "State of Charge and Loss of Active Material Estimation of a Lithium Ion Cell under Low Earth Orbit condition using Kalman Filtering Approaches," *Journal of the Electrochemical Society*, 159 (6), A860-A872 (2012).
<http://dx.doi.org/10.1149/2.098206jes>
311. Xiao Hu, Scott Stanton, Long Cai, and Ralph E. White, "A Linear Time-Invariant Model for Solid-Phase Diffusion in Physics-Based Lithium Ion Cell Models," *Journal of Power Sources*, 214 (4), 40-60 (2012).
<http://dx.doi.org/10.1016/j.jpowsour.2012.04.040>

312. Long Cai and Ralph E. White, "Lithium ion cell modeling using orthogonal collocation on finite elements," *Journal of Power Sources*, 217, 248-255 (2012).
313. Xiao Hu, Scott Stanton, Long Cai, and Ralph E. White, "Model Order Reduction for Solid-phase Diffusion in Physics-based Lithium Ion Cell Models," *Journal of Power Sources*, 218 (11), 212-220, (2012).
<http://dx.doi.org/10.1016/j.jpowsour.2012.07.007>
314. Meng Guo and Ralph E. White, "A distributed thermal model for a Li-ion electrode plate pair," *Journal of Power Sources*, 221, 334-344, (2013).
315. Long Cai, Yiling Dai, Marjorie Nicholson, Ralph E. White, Kamakshi Jagannathan, and Garima Bhatia. "Life modeling of a lithium ion cell with a spinel-based cathode," *Journal of Power Sources*, 221, 191-200, (2013).
316. Yiling Dai, Long Cai, and Ralph E. White, "Capacity Fade Model for Spinel LiMn_2O_4 Electrode," *Journal of the Electrochemical Society*, 160 (1), A182-A190, (2013).
317. Saeed Khaleghi Rahimian, Sean Rayman, and Ralph E. White, "Extension of physics-based single particle model for higher charge-discharge rates," *Journal of Power Sources*, 224, 180-194, (2013).
318. Meng Guo, Gi-Heon Kim, and Ralph E. White, "A three-dimensional multi-physics model for a Li-ion battery," *Journal of Power Sources*, 240, 80-94, (2013).
319. Mastafa Rahmzadeh, Long Cai, and Ralph White, "A new method of solving initial value problems," *Computers & Chemical Engineering*, 58(11), 33-39 (2013).
320. Meng Guo, Xuan Zhao, Ralph E. White, and Kevin Huang, "A Multi-Physics Model for Solid Oxide Iron-Air Redox Flow Battery: Simulation of Discharge Behavior at High Current Density," *Journal of the Electrochemical Society*, 160(11), A2085-2092 (2013).
321. Yiling Dai, Long Cai, and Ralph E. White, "Simulation and analysis of stress in a Li-ion battery with a blended LiMn_2O_4 and $\text{LiNi}_{0.8}\text{Co}_{0.15}\text{Al}_{0.05}\text{O}_2$ cathode," *Journal of Power Sources*, 27(2), 365-376, (2014).
322. Meng Guo and Ralph E. White, "Mathematical model for a spirally wound lithium-ion cell," *Journal of Power Sources*, 250(3), 220-235, (2014).
323. Kevin Huang, Xinfang Jin, Xuan Zhao, and Ralph White, "Heat Balance in a Planar Solid Oxide Iron-Air Redox Battery: A Computational Analysis," *Journal of the Electrochemical Society*, 162(8), F821-F833, (2015).
324. Xinfang Jin, Xuan Zhao, Ralph White and Kevin Huang, "Understanding the High-temperature Solid-oxide Iron-Air Redox Battery Operated with Oxygen Shuttle Mechanism: a Computational Study," *Journal of the Electrochemical Society*, 162(8), A1476-A1484, (2015).
325. Xinfang Jin, Xuan Zhao, Cuijuan Zhang, Ralph E. White and Kevin Huang, "Computational Analysis of Performance Limiting Factors for the New Solid Oxide Iron-air Redox Battery Operated at 550°C ," *Electrochimica Acta*, 178, 190-198, (2015).

326. Eric Walker, Sean Rayman, and Ralph E. White, "Comparison of a Particle Filter and other State Estimation Methods for Prognostics of Lithium-ion Batteries," *Journal of Power Sources*, 287(3), 1-12, (2015).
327. Xinfang Jin, Xuan Zhao, Farzana Yasmeen, Ralph E. White, and Kevin Huang, "Energy efficiency of an intermediate-temperature solid oxide iron-air redox battery," *Journal of Energy Storage*, 3, 1-9, (2015).
328. Paul T. Coman, Sean Rayman, and Ralph E. White, "A lumped model of venting during thermal runaway in a cylindrical Lithium Cobalt Oxide lithium-ion cell," *Journal of Power Sources*, 307(3), 56-62, (2016).
329. Xinfang Jin, Jie Wang, Long Jiang, Ralph E. White, and Kevin Huang, "A Finite Length Cylinder Model for Mixed Oxide-ion and Electron Conducting Cathodes Suited for Intermediate-temperature Solid Oxide Fuel Cells," *Journal of the Electrochemical Society*, 163(6), F548-F563, (2016).
330. Xinfang Jin, Ralph E. White, and Kevin Huang, "Simulating Charge Transport in Solid Oxide Mixed Ionic and Electronic Conductors: Nernst-Planck Theory vs Modified Fick's Law," *Journal of the Electrochemical Society*, 163(13), A2702-A2719, (2016).
331. Paul T. Coman, Eric C. Darcy, Christian T. Veje, and Ralph E. White, "Modelling Li-Ion Thermal Runaway Triggered by an Internal Short Circuit Device Using an Efficiency Factor and Arrhenius Formulations," *Journal of the Electrochemical Society*, 164(4), A587-A593, (2017).
332. Meng Guo, Xinfang Jin, and Ralph E. White, "Nonlinear State-Variable Method for Solving Physics-Based Li-Ion Cell Model with High-Frequency Inputs," *Journal of the Electrochemical Society*, 164(11), E3001-E3015, (2017).
333. Xinfang Jin, Meng Guo, Ralph E. White, and Kevin Huang, "Understanding Power Enhancement of SOFC by Built-in Chemical Iron Bed: A Computational Approach," *Journal of the Electrochemical Society*, 164(11), E3054-E3062, (2017).
334. Meng Guo, Xinfang Jin, and Ralph E. White, "Nonlinear State-Variable Method (NSVM) for Li-Ion Batteries: Finite-Element Method and Control Mode," *Journal of the Electrochemical Society*, 164(11), E3200-E3214, (2017).

335. Paul T. Coman, Stefan M'at'efi-Tempfli, Christian T. Veje, and Ralph E. White, "Modeling Vaporization, Gas Generation and Venting in Li-ion Battery Cells with a Dimethyl Carbonate Electrolyte," *Journal of the Electrochemical Society*, 164(9), A1858-A1865 (2017).
336. Shriram Santhanagopalan and Ralph E. White, "Estimating Parameters from Rotating Ring Disc Electrode Measurements," *Russian Journal of Electrochemistry*, 53(10), 1087-1099.
337. Paul T. Coman, Eric C. Darcy, Christian T. Veje, and Ralph E. White, "Numerical analysis of heat propagation in a battery pack using a novel technology for triggering thermal runaway," *Applied Energy*, 203(2017), 189-200.
338. Meng Guo, Xinfang Jin, and Ralph E. White, "An adaptive Reduced-Order-Modeling Approach for Simulating Real-Time Performances of Li-Ion Battery Systems," *Journal of the Electrochemical Society*, 164(14), A3602-A3613 (2017).
339. Victoria F. Mattick, Xinfang Jin, Tianrang Yang, Ralph E. White, and Kevin Huang, "Unraveling Oxygen Electrocatalysis Mechanisms on a Thin Film Oxygen Deficient Perovskite La_{0.6}Sr_{0.4}CoO_{3-δ}," *Applied Energy Materials*, DOI: [10.1021/acsaem.8b00669](https://doi.org/10.1021/acsaem.8b00669)

Papers Accepted

1. None

Papers Under Review

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Books Edited or Co-Edited

1. *Electrochemical Cell Design*, R. E. White, Ed., Plenum Publishing Corp., New York, NY, 1984.
2. *Comprehensive Treatise on Electrochemistry*, 2, J. O'M. Bockris, B. E. Conway, E. Yeager, and R. E. White, Eds., Plenum Publishing Corp., New York, NY, 1981.
3. *Comprehensive Treatise on Electrochemistry*, 3, J. O'M. Bockris, B. E. Conway, E. Yeager, and R. E. White, Eds., Plenum Publishing Corp., New York, NY, 1981.

4. Comprehensive Treatise on Electrochemistry, 4, J. O'M. Bockris, B. E. Conway, E. Yeager, and R. E. White, Eds., Plenum Publishing Corp., New York, NY, 1981.
5. Comprehensive Treatise on Electrochemistry, 7, B. E. Conway, J. O'M. Bockris, E. Yeager, S. U. M. Kahn, and R. E. White, Eds., Plenum Publishing Corp., New York, NY, 1983.
6. Comprehensive Treatise on Electrochemistry, 8, R. E. White, J. O'M. Bockris, B. E. Conway, and E. Yeager, Eds., Plenum Publishing Corp., New York, NY, 1984.
7. Modern Aspects of Electrochemistry, 14, J. O'M. Bockris, B. E. Conway, and R. E. White, Eds., Plenum Publishing Corp., New York, NY, 1982.
8. Modern Aspects of Electrochemistry, 15, Ralph E. White, J. O'M. Bockris, and B. E. Conway, Eds., Plenum Publishing Corp., New York, NY, 1983.
9. Modern Aspects of Electrochemistry, 16, B. E. Conway, Ralph E. White, and J. O'M. Bockris, Eds., Plenum Publishing Corp., New York, NY, 1985.
10. Modern Aspects of Electrochemistry, 17, J. O'M. Bockris, R. E. White, and B. E. Conway, Eds., Plenum Publishing Corp., New York, NY, 1986.
11. Modern Aspects of Electrochemistry, 18, R. E. White, B. E. Conway, and J. O'M. Bockris, Eds., Plenum Publishing Corp., New York, NY, 1986.
12. Modern Aspects of Electrochemistry, 19, B. E. Conway, J. O'M. Bockris, and R. E. White, Eds., Plenum Publishing Corp., New York, NY, 1989.
13. Modern Aspects of Electrochemistry, 20, J. O'M. Bockris, R. E. White, and B. E. Conway, Eds., Plenum Publishing Corp., New York, NY, 1989.
14. Modern Aspects of Electrochemistry, 21, R. E. White, B. E. Conway, and J. O'M. Bockris, Eds., Plenum Publishing Corp., New York, NY, 1990.
15. Modern Aspects of Electrochemistry, 22, B. E. Conway, J. O'M. Bockris, and R. E. White, Eds., Plenum Publishing Corp., New York, NY, 1991.
16. Modern Aspects of Electrochemistry, 23, B. E. Conway, J. O'M. Bockris, and R. E. White, Eds., Plenum Publishing Corp., New York, NY, 1992.
17. Modern Aspects of Electrochemistry, 24, R. E. White, J. O'M. Bockris, and B. E. Conway, Eds., Plenum Publishing Corp., New York, NY, 1993.
18. Modern Aspects of Electrochemistry, 25, J. O'M. Bockris, B. E. Conway, and R. E. White, Eds., Plenum Publishing Corp., New York, NY, 1993.
19. Modern Aspects of Electrochemistry, 26, B. E. Conway, J. O'M. Bockris, and R. E. White, Eds., Plenum Publishing Corp., New York, NY, 1994.
20. Modern Aspects of Electrochemistry, 27, R. E. White, J. O'M. Bockris, and B. E. Conway, Eds., Plenum Publishing Corp., New York, NY, 1994.
21. Modern Aspects of Electrochemistry, 28, B. E. Conway, J. O'M. Bockris, and R. E. White, Eds., Plenum Publishing Corp., New York, NY, 1995.
22. Modern Aspects of Electrochemistry, 29, J. O'M. Bockris, B. E. Conway, and R. E. White, Eds., Plenum Publishing Corp., New York, NY, 1996.
23. Modern Aspects of Electrochemistry, 30, R. E. White, B. E. Conway, and J. O'M. Bockris, Eds., Plenum Publishing Corp., New York, NY, 1996.
24. Modern Aspects of Electrochemistry, 31, J. O'M. Bockris, R. E. White, B. E. Conway, Eds., Plenum Publishing Corp., New York, NY, 1997.
25. Modern Aspects of Electrochemistry, 32, B. E. Conway, J. O'M. Bockris, R. E. White, Eds., Plenum Publishing Corp., New York, NY, 1998.

26. Modern Aspects of Electrochemistry, 33, R. E. White, J. O'M. Bockris, B. E. Conway, Eds., Plenum Publishing Corp., New York, NY, 1999.
27. Modern Aspects of Electrochemistry, 34, J. O'M. Bockris, B. E. Conway, and Ralph E. White, Eds., Plenum Publishing Corp., New York, NY, 2001.
28. Modern Aspects of Electrochemistry, 35, B. E. Conway, and Ralph E. White, Eds., Plenum Publishing Corp., New York, NY, 2002.
29. Modern Aspects of Electrochemistry, 36, Costas G. Vayenas, B. E. Conway, and Ralph E. White, Eds., Plenum Publishing Corp., New York, NY, 2003.
30. Modern Aspects of Electrochemistry, 37, Ralph E. White, B. E. Conway, and C. G. Vayenas, Eds., Kluwer/Plenum Publishers, New York, NY, 2004.
31. Modern Aspects of Electrochemistry, 38, B. E. Conway, C. G. Vayenas, and Ralph E. White, Eds., Kluwer/Plenum Publishers, New York, NY, 2005.
32. Modern Aspects of Electrochemistry, 39, C. G. Vayenas, and Ralph E. White, Eds., Springer, New York, NY, 2006.
33. Modern Aspects of Electrochemistry, 40, Ralph E. White, and C. G. Vayenas, Eds., Springer, New York, NY, 2007.
34. Modern Aspects of Electrochemistry, 41, Constantinos Vayenas and Ralph E. White, Eds., Springer, New York, NY, 2007.
35. Modern Aspects of Electrochemistry, 42, Constantinos G. Vayenas and Ralph E. White, Eds., Springer, New York, NY, 2008.
36. Modern Aspects of Electrochemistry, 45, Ralph E. White and Constantinos Vayenas, Series Eds., Springer, New York, NY, 2009.
37. Modern Aspects of Electrochemistry: Progress in Corrosion Science and Engineering I, 46, Ralph E. White and Constantinos Vayenas, Series Eds., Springer, New York, NY, 2009.
38. Modern Aspects of Electrochemistry: Electrodeposition Theory and Practice, 48, Ralph E. White and Constantinos G. Vayenas, Series Eds., Springer, New York, NY, 2010.
39. Modern Aspects of Electrochemistry: Modeling and Diagnostics of Polymer Electrolyte Fuel Cells, 49, Ralph E. White and Constantinos G. Vayenas, Series Eds., Springer, New York, NY, 2010.
40. Modern Aspects of Electrochemistry: Applications of Electrochemistry and Nanotechnology in Biology and Medicine I, 52, Ralph E. White and Constantinos G. Vayenas, Series Editors, Springer, New York, NY 2011.
41. Modern Aspects of Electrochemistry, Applications of Electrochemistry and Nanotechnology in Biology and Medicine II, 53, Ralph E. White and Constantinos G. Vayenas, Series Editors, Springer, New York, NY 2012.
42. Industrial Membrane Processes, R. E. White and P. N. Pintauro, Eds., AIChE Symposium Series, American Institute of Chemical Engineers, New York, NY, 1986.
43. Proceedings of the Symposium on Engineering of Industrial Electrolytic Processes, U. Landau, R. E. White, and R. Varjian, Eds., The Electrochemical Society, Inc., Pennington, NJ, 1986.
44. Proceedings of the Symposium on Diaphragms, Separators, and Ion-Exchange Membranes, J. Van Zee, R. E. White, K. Kinoshita, and H. Burney, Eds., The Electrochemical Society, Inc., Pennington, NJ, 1986.

45. Electrochemical Engineering Applications, R. E. White, R. F. Savinell, and A. Schneider, Eds., AIChE Symposium Series, American Institute of Chemical Engineers, New York, NY, 1987.
46. Proceedings of the Symposium on Electrochemical Engineering in the Chlor-Alkali and Chlorate Industries, F. Hine, B. Darlington, R. E. White, and R. Varjian, Eds., The Electrochemical Society, Inc., Pennington, NJ, 1988.
47. Proceedings of the Symposium on Fuel Cells, R. E. White, and A. J. Appleby, Eds., The Electrochemical Society, Inc., Pennington, NJ, 1989.
48. Proceedings of the Symposium on Modeling of Batteries and Fuel Cells, R. E. White, M. W. Verbrugge and J. F. Stockel, Eds., The Electrochemical Society, Inc., Pennington, NJ, 1991.
49. Proceedings of the Symposium on Metal Deposition and Dissolution, Der-Tau Chin, John W. Van Zee, Ralph E. White and John W. Weidner, Eds., The Electrochemical Society, Inc., Pennington, NJ, 1992.
50. Proceedings of the Bennion Memorial Symposium, John Newman and Ralph E. White, Eds., The Electrochemical Society, Inc., Pennington, NH, 1994.

Contributions to Books (Chapters and Books)

1. R. E. White, M. L. Becker, C. J. Glover, and R. Darby, "Electrochemical Analysis of Surfactants for Microemulsion Flooding, SPE. 9353." *Proceedings of the 55th Annual Fall Technical Conference and Exhibition of the Society of Petroleum Engineers of AIME*. Dallas, Texas, September 21–24, 1980. Dallas: American Institute of Mining, Metallurgical, and Petroleum Engineers, 1980.
2. R. E. White, D. L. Caldwell, K. A. Poush, and J. W. Van Zee, "Mathematical Model of the Chlorine Cell Diaphragm," *Proceedings of the Symposium on Electrochemical Processes and Plant Design*, Richard C. Alkire, Theodore R. Beck, and Richard D. Varjian, Eds., The Electrochemical Society, Inc., Pennington, NJ, 1983.
3. R. E. White, M. Bain, and M. A. Raible, "A Parallel Plate Electrochemical Reactor Model," *Proceedings of the Symposium on Electrochemical Processes and Plant Design*, Richard C. Alkire, Theodore R. Beck, and Richard D. Varjian, Eds., The Electrochemical Society, Inc., Pennington, NJ, 1983.
4. J. Van Zee and R. E. White, "Analysis of a Back-Fed Porous Electrode for Bromine Reduction," *Proceedings of the Symposium on Electrochemical Processes and Plant Design*, Richard C. Alkire, Theodore R. Beck, and Richard D. Varjian, Eds., The Electrochemical Society, Inc., Pennington, NJ, 1983.
5. R. E. White, K. A. Poush, D. L. Caldwell, and J. W. Van Zee, "Characterization of Asbestos Diaphragms for Chlor/Alkali Electrolysis," *Modern Chlor-Alkali Technology: Volume 2*, C. Jackson, Ed., Chichester, West Sussex, England, 1983.
6. R. E. White, M. A. Nicholson, L. G. Kleine, J. Van Zee, and R. Darby, "Extension of Darby's Model of a Hydrophobic Gas-Fed Porous Electrode," *Proceedings of the Symposium on Porous Electrodes: Theory and Practice*, H. C. Maru, T. Katan, and M. G. Klein, Eds., The Electrochemical Society, Inc., Pennington, NJ, 1984.

- 7 J. A. Holmes and R. E. White, "A Finite Element Based Model of a Bipolar Electrochemical Cell," *Electrochemical Cell Design*, R. E. White, Ed., Plenum Publishing Corp., New York, NY, 1984.
- 8 J. Van Zee, R. E. White, P. L. Grimes and R. J. Bellows, "A Simple Model of Exxon's Zn/Br₂ Battery," *Electrochemical Cell Design*, R. E. White, Ed., Plenum Publishing Corp., New York, NY, 1984.
- 9 R. E. White, J. Beckerdite, and J. Van Zee, "A Simple Model of a Diaphragm-Type Chlorine Cell," *Electrochemical Cell Design*, R. E. White, Ed., Plenum Publishing Corp., New York, NY, 1984.
- 10 R. E. White, J. Van Zee, G. Kleine, and J. Newman, "Extension of Newman's Numerical Technique to Pentadiagonal Systems of Equations," *Electrochemical Cell Design*, R. E. White, Ed., Plenum Publishing Corp., New York, NY, 1984.
- 11 R. E. White, "Diffusion Coefficient of Zinc in Aqueous Zinc Bromide Solutions," *Proceedings of the Workshop on the Electrochemistry of Zinc/Halogen Batteries*, Electric Power Research Institute, Palo Alto, CA, 1984.
- 12 R. E. White, H. S. Burney, and R. N. Beaver, "Two Methods for Predicting Shunt Currents in Stacks of Bipolar Plate Cells," *Modern Chlor-Alkali Technology: Volume 3*, K. Wall, Ed., Chichester, West Sussex, England, 1986.
- 13 R. B. Griffin, G. Burnell, L. R. Cornwell, W. Sutz, E. Estes, and R. E. White, "Texas A&M University Marine Corrosion Facility, Galveston, Texas," Paper 215, Corrosion '85, National Association of Corrosion Engineers, Houston, Texas.
- 14 M. Mader, C. W. Walton, and R. E. White, "Parallel Plate Electrochemical Reactor Model: An Extension and a Time-Saving Approximation Method," *Proceedings of the Symposium on Engineering of Industrial Electrolytic Processes*, U. Landau, R. E. White, R. Varjian, Eds., The Electrochemical Society, Inc., Pennington, NJ, 1986.
- 15 M. J. Mader and R. E. White, "A Mathematical Model of a Zinc/Bromine Cell on Charge," *Proceedings of the Symposium on Engineering of Industrial Electrolytic Processes*, U. Landau, R. E. White, R. Varjian, Eds., The Electrochemical Society, Inc., Pennington, NJ, 1986.
- 16 T. V. Nguyen, C. W. Walton, and R. E. White, "A Mathematical Model for a Parallel Plate Electrochemical Reactor, CSTR, and Associated Recirculation System," *Proceedings of the Symposium on Engineering of Industrial Electrolytic Processes*, U. Landau, R. E. White, and R. Varjian, Eds., The Electrochemical Society, Inc., Pennington, NJ, 1986.
- 17 T. I. Evans and R. E. White, "A Mathematical Model of a Zinc/Bromine Flow Cell," *Proceedings of the Symposium on Electrochemical and Thermal Modeling of Battery, Fuel Cell, and Photoenergy Conversion Systems*, J. R. Selman and H. C. Maru, Eds., The Electrochemical Society, Inc., Pennington, NJ, 1986.
- 18 T. I. Evans and R. E. White, "A Review of Mathematical Modeling of the Zinc/Bromine Flow Cell and Stack of Cells," *Proceedings of the Symposium on Electrochemical and Thermal Modeling of Battery, Fuel Cell, and Photoenergy Conversion Systems*, J. R. Selman and H. C. Maru, Eds., The Electrochemical Society, Inc., Pennington, NJ, 1986.

19. H. Burney, R. Spradling, and R. White, "Determining the Optimum HCl Addition Rate for Chlor-Alkali Cells with Different Types of Anodes," *Proceedings of the Symposium on Diaphragms, Separators, and Ion-Exchange Membranes*, J. Van Zee, R. E. White, K. Kinoshita, and H. Burney, Eds., The Electrochemical Society, Inc., Pennington, NJ, 1986.
20. C. W. Walton and R. E. White, "Utility of Menschig's Empirical Method of Modeling Combined Zero Gap/Attached Electrode Membrane Chlor-Alkali Cells," *Proceedings of the Symposium on Diaphragms, Separators, and Ion-Exchange Membranes*, J. Van Zee, R. E. White, K. Kinoshita, and H. Burney, Eds., The Electrochemical Society, Inc., Pennington, NJ, 1986.
21. R. B. Griffin, L. R. Cornwell, C. Wong, and R. E. White, "Comparison Between Electro-chemical and Weight Change Corrosion Rate Measurements in Seawater," Paper Number 223, Corrosion '86, National Association of Corrosion Engineers, Houston, Texas.
22. S. Chen and R. E. White, "A Mathematical Model for the Electrodeposition of Amorphous Alloys on a Rotating Disk Electrode," *Proceedings of the Symposium on Electro-deposition Technology: Theory and Practice*, L. T. Romankiw and D. R. Turner, Eds., The Electrochemical Society, Inc., Pennington, NJ, 1987.
23. J. L. Carbajal, R. E. White, R. B. Griffin, and J. N. Dubrouillet, "Corrosion Behavior of Amorphous (Ti₉₀Ru₁₀)₈₇Si₁₃," Paper 353, Corrosion '87, National Association of Corrosion Engineers, Houston, Texas.
24. C. W. Walton and R. E. White, "Transport in Bilayer Membrane Chlor-Alkali Electrolysis Cells," *Proceedings of the Symposium on Electrochemical Engineering in the Chlor-Alkali and Chlorate Industries*, F. Hine, B. Darlington, R. E. White, and R. Varjian, Eds., The Electrochemical Society, Inc., Pennington, NJ, 1988.
25. H. S. Burney and R. E. White, "Predicting Shunt Currents in Stacks of Bipolar Plate Cells with Conducting Manifolds," *Proceedings of the Symposium on Electrochemical Engineering in the Chlor-Alkali and Chlorate Industries*, F. Hine, B. Darlington, R. E. White, and R. Varjian, Eds., The Electrochemical Society, Inc., Pennington, NJ, 1988.
26. Michael C. Kimble, Ralph E. White, and R. Neal Beaver, "Estimation of the Diffusion Coefficient and Solubility for a Gas Diffusing Through a Membrane," *Proceedings of the Symposium on Fuel Cells*, R. E. White and A. J. Appleby, Eds., The Electrochemical Society, Inc., Pennington, NJ, 1989.
27. R. B. Griffin, R. E. White, and D. G. Naugle, "Corrosion Behavior of Melt Spun Ni₃CryP₂₀ Alloys," *Industry-University Advanced Materials Conference #2 Proceedings*, F. W. Smith, Ed., Advanced Materials Institute, Colorado School of Mines, Golden, CO, 1989.
28. D. L. Cocke, Oscar Mendoza, Ben A. Horrell, R. E. White, and D. G. Naugle, "Stability of Amorphous Ni-TM-M Alloys Prepared by Various Techniques," *Industry-University Advanced Materials Conference #2 Proceedings*, F. W. Smith, Ed., Advanced Materials Institute, Colorado School of Mines, Golden, CO, 1989.
29. Jose L. Carbajal and Ralph E. White, "Adsorption and Absorption of Hydrogen in Metals. FTIR and RT Approach: From the 20th to the 21st Century," *Electrochemistry in*

- Transition*, Oliver Murphy, S. Srinivasan, and Brian E. Conway, Eds., Plenum Publishing Corporation, New York, NY, pages 339-357 (1992)..
30. C. Zhang, R. E. White, J. B. Kim, A. J. Appleby, and S. Srinivasan, "Hydrogen Oxidation on Nickel Electrodes in Alkaline Media," *Proceedings of the Symposium on Nickel Hydroxide Electrodes*, D. A. Corrigan and A. Zimmerman, Ed., The Electrochemical Society, Inc., Pennington, NJ, 1990.
 31. Eric C. Darcy, Eric E. Kalu, and Ralph E. White, "Calorimetric Determination of Thermal Parameters for the Li/BrCl in SOCl₂ (BCX) Chemistry," *Power Sources Symposium*, August 1990.
 32. Z. Mao and R. E. White, "Mathematical Modeling of a Primary Zinc/Air Battery," *Proceedings of the Symposium on Modeling of Batteries and Fuel Cells*, R. E. White, M. W. Verbrugge and J. F. Stockel, Eds., The Electrochemical Society Inc., Pennington, NJ, 1991.
 33. R. M. Spotnitz, D. Zuckerbrod, S. L. Johnson, J. T. Lundquist and R. E. White, "Mathematical Modelling of Grace Li-TiS₂ Cells," *Proceedings of the Symposium on Modeling of Batteries and Fuel Cells*, R. E. White, M. W. Verbrugge and J. F. Stockel, Eds., The Electrochemical Society Inc., Pennington, NJ, 1991.
 34. D. Fan and R. E. White, "Extension of Newman's Tridiagonal and Pentadiagonal BAND(J) Subroutines to Multi-Region Systems Containing Interior Boundaries," *Proceedings of the Symposium on Modeling of Batteries and Fuel Cells*, R. E. White, M. W. Verbrugge and J. F. Stockel, Eds., The Electrochemical Society Inc., Pennington, NJ, 1991.
 35. D. Fan and R. E. White, "Modeling of Nickel Cadmium Cells," *Nickel Cadmium Battery Handbook*, S. Gross, Ed., Wiley, NY, submitted to Editor, 1991.
 36. Jenn-Feng Yan, R. E. White, and R. B. Griffin, "Deposition of Calcareous Films on Cathodically Protected Steel in Seawater," *Proceedings of 1992 Science, Engineering and Technology Seminars*, Chang Wang, Ed., The Association of American Chinese Professionals, Houston, Texas, May, 1992.
 37. R. B. Griffin, J.-F. Yan, and R. E. White, "Prediction of Dynamic Current Density on Cathodically Protected Steel in Seawater at Different Depths," *Houston International Corrosion Conference Proceedings*, Technical Session 35, Cathodic Protection, Houston, Texas, May, 1993.
 38. B. S. Haran, G. Zheng, B. N. Popov, and R. E. White, "Electrochemical Decontamination of Soils: Development of a New Electrochemical Method for Decontamination of Hexavalent Chromium From Sand," *Proceedings of the Symposium on Electrochemical Technology Applied to Environmental Problems*, C. Hammel and J. M. Fenton, Eds., The Electrochemical Society Inc., Pennington, NJ, 1995.
 39. R. E. White and P. De Vidts, "Mathematical Modeling of Batteries," *Proceedings of the Symposium on Electrochemical Process Design*, J. Fenton and J. B. Talbot, Eds., The Electrochemical Society Inc., Pennington, NJ, 1995.
 40. S. N. R. Pakalapati, B. N. Popov, R. E. White, and D. T. Hobbs, "Anodic Oxidation of Tetrasodium Ethylenediaminetetraacetic Acid in Alkaline Solutions," *Proceedings of the*

Symposium on Electrochemical Process Design, J. H. Wagenknecht and N. L. Weinberg, Eds., The Electro-chemical Society Inc., Pennington, NJ, 1995.

41. Bala S. Haran, Branko N. Popov, and Ralph E. White, "Electrochemical Characterization of Hydrogen Storage Alloys Modified by Electroless Cobalt Coatings," *Proceedings-Electrochemical Society* (1997), 97-16(Electrochemical Surface Science of Hydrogen Adsorption and Absorption), 225-235.
42. Bala S. Haran, Branko N. Popov, and Ralph E. White, "Theoretical Model of the Metal Hydride Electrode: Determination of Thermodynamic and Kinetic Parameters," *Proceedings-Electrochemical Society* (1997), 97-16(Electrochemical Surface Science of Hydrogen Adsorption and Absorption), 247-258.
43. B. N. Popov and R. E. White, "Development of Novel Cathode Materials for Li-ion Batteries," Annual Battery Conference on Applications and Advances, 13th, Long Beach, CA, Jan 13-16, 1998 (1998) 387-392.
44. Pankaj Arora, B. N. Popov, and R. E. White, "Fundamental Modeling of Chloride Diffusion in Concrete," Materials for the New Millennium, Proceedings of the Materials Engineering Conference, 4th, Washington, D.C., Nov. 10-14, 1996 (1996), 1, 203-212.
45. Bala S. Haran, Branko N. Popov, and Ralph E. White, "Studies on Galvanized Carbon Steel in Ca(OH)₂ Solutions," Materials for the New Millennium, Proceedings of the Materials Engineering Conference, 4th, Washington, D.C., Nov. 10-14, 1996 (1996), 2, 997-1006.
46. M. Ramasubramanian, B. N. Popov, and R. E. White, "Inhibiting Action of Calcium Nitrate on Carbon Steel Rebars," Materials for the New Millennium, Proceedings of the Materials Engineering Conference, 4th, Washington, D.C., Nov. 10-14, 1996 (1996), 2, 1007-1016.
47. D. H. Coleman, B. N. Popov, and R. E. White, "Corrosion and Hydrogen Permeation Inhibition by Thin Layer Zn-Ni Alloy Electrodeposition," Materials for the New Millennium, Proceedings of the Materials Engineering Conference, 4th, Washington, D.C., Nov. 10-14, 1996 (1996), 2, 1281-1287.
48. Branko N. Popov, Dong Zhang, Pankaj Arora, and Ralph E. White, "Synthesis and Characterization of Chromium Oxides and Cobalt Doped Chromium Oxides as Cathode Materials for Lithium Batteries," *Proceedings-Electrochemical Society* (1999), 98-16(Lithium Batteries), 339-349.
49. Gerardine G. Botte, Bradley A. Johnson, and Ralph E. White, "Influence of Some Design Variables on the Thermal Behavior of a Lithium-ion Cell," *Proceedings-Electrochemical Society* (1999), 98-16(Lithium Batteries), 526-552.
50. Pankaj Arora, Marc Doyle, and Ralph E. White, "Mathematical Modeling of Capacity Fade Mechanisms in Lithium-ion Batteries: Lithium Deposition Overcharge Reaction on the Negative Electrode," *Proceedings-Electrochemical Society* (1999), 98-16(Lithium Batteries), 553-572.
51. Yuanwu Xie, Branko N. Popov, Bala S. Haran, and Ralph E. White, "A Novel Electrochemical Method for Detection of Nerve Gases," *Proceedings-Electrochemical Society* (1999), 99-5(New Directions in Electroanalytical Chemistry II), 178-192.

52. Manikandan Ramani, Bala S. Haran, Branko N. Popov, and Ralph E. White, "Development of Carbon Metal Oxide Supercapacitors by Electroless Deposition," *Proceedings-Electrochemical Society* (1999), 98-15(Selected Battery Topics), 226-235.
53. Chuan Lin, James A. Ritter, Branko N. Popov, and Ralph E. White, "A Mathematical Model of an Electrochemical Capacitor with Double-layer and Faradaic Processes," *Proceedings-Electrochemical Society* (1999), 98-15(Selected Battery Topics), 236-247.
54. Anand Durairajan, Bala S. Haran, and Ralph E. White, "Development of High Performance Metal Hydride Alloys By Cobalt Microencapsulation," *Proceedings-Electrochemical Society* (1999), 98-15(Selected Battery Topics), 368-378.
55. Dong Zhang, Branko N. Popov, and Ralph E. White, "Optimization of Cobalt Doped Chromium Oxide as Cathode Material for Secondary Lithium Batteries," *Proceedings of the SAE Intersociety Energy Conversion Engineering Conference* (1999), 34th, 670-675.
56. Venkat R. Subramanian and Ralph E. White, "A Semi-Analytical Method for Predicting Current and Potential Distributions," *Proceedings-Electrochemical Society* (1999), 99-14(Tutorials in Electrochemical Engineering – Mathematical Modeling), 36-53.
57. Venkat R. Subramanian and Ralph E. White, "Separation of Variables for Diffusion in Composite Electrodes with Flux Boundary Conditions," *Proceedings-Electrochemical Society* (1999), 99-14(Tutorials in Electrochemical Engineering – Mathematical Modeling), 100-113.
58. Anand Durairajan, Bala S. Haran, Branko N. Popov, and Ralph E. White, "Battery Research at the University of South Carolina Development of High Performance Metal Hydride Alloys by Cobalt Microencapsulation," Annual Battery Conference on Applications and Advances, 14th, Long Beach, CA, Jan. 12-15, 1999 (1999), 111-117.
59. Gerardine G. Botte and Ralph E. White, "Modeling Lithium Intercalation in a Porous Carbon Electrode," *Proceedings-Electrochemical Society* (2000), 99-25(Lithium Batteries), 99-128.
60. Venkat R. Subramanian, Harry J. Ploehn, and Ralph E. White, "Shrinking Core Model for the Discharge of a Metal Hydride Electrode," *Proceeding-Electrochemical Society* (2000), 2000-16(Hydrogen at Surface and Interfaces), 123-132.
61. Bala S. Haran, Anand Durairajan, Branko N. Popov, and Ralph E. White, "Studies on the Hydrogen Transport Rate in Metal Hydride Alloys," *Proceedings-Electrochemical Society* (2000), 2000-16(Hydrogen at Surface and Interfaces), 219-232.
62. Venkat R. Subramanian, James A. Ritter, and Ralph E. White, "Modeling the Discharge of Electrode Particles-Utility of the Parabolic Concentration Profiles," *Proceedings-Electrochemical Society*, (2001), 2000-21(Rechargeable Lithium Batteries), 467-477.
63. Lorna Soto, Bala S. Haran, Branko N. Popov, and Ralph E. White, "Evaluation of Protective Strategies for Protecting Steel in Concrete," *Proceedings-Electrochemical Society*, (2001), 2001-22(Corrosion and Corrosion Protection), 939-949.
64. Dragan Slavtsov, Bala S. Haran, Branko N. Popov, Ralph E. White, and Frank Fleming, "Effect of Sn and Ca doping on the Corrosion of Pb Anodes in Lead Acid Batteries,"

- Proceedings- Electrochemical Society* (2003), 2001-21(Batteries and Capacitors), 313-326.
65. Venkat R. Subramanian, Ping Yu, Branko N. Popov, and Ralph E. White, "Lithium Intercalation into Graphite: Predicting Diffusion Coefficient and Exchange Current from the Discharge Curves," *Proceedings- Electrochemical Society* (2004), 2000-34 (Electrochemistry of Carbon Materials), 124-136.
 66. Harry J. Ploehn, Premanand Ramadass, Ralph E. White, Diego Altomare, and Perla B. Balbuena, "Continuum and Statistical Mechanics-Based Models for Solid Electrolyte Interfaces in Lithium-Ion Batteries," *Lithium-Ion Batteries: Solid-Electrolyte Interphase*, P. B. Balbuena and Y. Wang, Eds., Imperial College Press, London, 2004, 276-307.
 67. Karthikeyan Kumaresan, Godfrey Sikha, and Ralph E. White, "Comparison of Thermal-electrochemical Model Predictions with Experimental Discharge Data for Lithium-ion Batteries," *ECS Transactions* (2007) 3(27, Lithium-Ion Batteries), 173-190.
 68. Shriram Santhanagopalan and Ralph E. White, "Modeling Parametric Uncertainty Using Polynomial Chaos Theory," *ECS Transactions* (2007), 3(27, Lithium-Ion Batteries), 243-256.
 69. Shriram Santhanagopalan and Ralph E. White, "Online Estimation of State of Charge in a Lithium Ion Cell," *ECS Transactions* (2007), 3(27, Lithium-Ion Batteries), 191-208.
 70. Andrew T. Stamps and Ralph E. White, "A LiCF_x/Li-ion Hybrid Power System for Pulsed-Power Applications," *Proceedings of the Power Sources Conference*, 43rd, (2008), 473-476.
 71. Qingbo Dong and Ralph E. White, "Parameter Evaluation of ORR at a RRDE," *ECS Transactions* (2008), 6 (22, Power Sources for EV and HEV Applications), 15-31.
 72. Qi Zhang and Ralph E. White, "Moving Boundary for the Discharge of a LiCoO₂ Electrode," *ECS Transactions* (2008), 6(22, Power Sources for EV and HEV Applications), 33-52.
 73. Shriram Santhanagopalan, Long Cai, and R. White, "Mathematical Modeling of Lithium Ion Batteries," *ECS Transactions* (2008) 16 (13, Tutorial Symposium on Electrochemical Engineering, in Honor of Professor John Newman's 70th Birthday), 81-90.
 74. Long Cai and Ralph E. White, "Simulation of a Parallel Plate Electrochemical Reaction used to reduce Cr(VI) via Electrocoagulation Method," *ECS Transactions* (2008), 11(32, Battery/Energy Technology (General)), 151-165.
 75. Long Cai and Ralph E. White, "Model Reduction via Proper Orthogonal Decomposition for the Lithium Ion Battery," *ECS Transactions* (2008), 13(19, Batteries (General)), 13-26.
 76. Godfrey Sikha, W. A. McPhee, Qi Zhang, M. T. Koslowski, T. T. Tao, and R. E. White, "One-dimensional Modeling of a Liquid Tin Anode Solid Oxide Fuel Cell," *ECS Transactions* (2009), 17 (1, Fuel Cell Seminar 2008), 161-173.
 77. Parthasarathy M. Gomadam, Ralph E. White, and John W. Weidner, "Electrochemical-thermal Modeling of Spirally Wound Batteries," *ECS Transactions* (2009), 19(19, Tutorials in Electrochemical Technology-Current Distribution), 1-10.

77. S. Santhanagopalan and R. E. White, "Porous Electrodes," In: Juergen Garche, Chris Dyer, Patrick Moseley, Zempachi Ogumi, David Rand and Bruno Scrosati, editors. Encyclopedia of Electrochemical Power Sources, Vol. 2. Amsterdam: Elsevier; 2009. pp. 110-120.
78. Ralph E. White and Venkat Subramanian, "Computational Methods in Chemical Engineering with Maple," Springer, 2010, 860 pages, ISBN 978-3642043109.
79. Shriram Santhanagopalan and Ralph E. White, "*Mathematical Modeling of Batteries*," in Linden's Handbook of Batteries, Ed. Thomas B. Reddy, McGraw-Hill, 2011, Chapter 6, page 6.1. 80. Shriram Santhanagopalan and Ralph E. White, "*Electrocatalytic Reactor Design*," Surfactant Science Series (2010), 149(Electrocatalysis), 417-441.

Other Publications

1. R. E. White, Charles M. Mohr, Jr., Pete Fedkiw, and John Newman, "The Fluid Motion Generated by a Rotating Disk: A Comparison of Solution Techniques," Lawrence Berkeley Laboratory, University of California at Berkeley, LBL-3910, September 1975.
2. R. E. White and K. R. Hall, "Chemical Engineering at Texas A&M," *Chemical Engineering Education*, September 1979.
3. J. Van Zee, M. A. Edmund and R. E. White, "Application of Newman's Technique to Coupled Nonlinear Partial Differential Equations," TEES Tech. Bul. No. 81-1, January 1981.
4. Venkat R. Subramanian and Ralph E. White, "Simulating Series Reactions with Maple," *CACHE Newsletter*, Spring 2002, web only document.

PATENTS U.S. Patent No. 5,019,227 Electrochemical Method for Producing Hydrogen and Sulfur

INTELLECTUAL PROPERTY DISCLOSURES

USCRF 00332	A Software for the Estimation of Solid Phase Diffusion Coefficient of Lithium-Ion Batteries
USCRF 00430	On-line Fuel Cell Parameter Estimation
USCRF 00563	Online Estimation of the State of Charge of an Electrochemical Cell e.g., a Li ion Cell) using a First Principles-based Model
USCRF 00498	Software for Predicting the EIS of a Fuel Cell
USCRF 00481	Mathematical Modeling of a Li-Ion Cell Using 1D-2D Coupled Approach
USCRF 00479	Software for Predicting the Cycle Life of a Lithium Ion Battery Using a Particle Model
USCRF 00478	Software for Determining Kinetic Parameters for the Oxygen Reduction Reaction Using the RDE Technique and Nonlinear Regression
USCRF 00574	A VTB Module (the Programmable Arbin Controller) for Controlling Battery Cycling in VTB
USCRF 95110sw	Nickel Hydrogen Battery Model Version 2.0

USCRF 93086sw Nickel/Hydrogen Battery Model
 USCRF xxxxx A Method to Convert Differential Algebraic Equation (DAE) Models to Resistive Companion, (RC) with Form, Andrew T. Stamps, Ralph E. White, Edward P. Gatzke, 12/13/2006
 USCRF xxxxx A Dynamic Systems Solver, Andrew T. Stamps, Ralph E. White, Edward P. Gatzke, 9/21/2006

RESEARCH GRANTS AND CONTRACTS - CURRENT SUPPORT AS CO-PI

Agency or Company	Title	Amount	Period
1. Huawei	Electrochemical Thermal Coupled Model and Model Development for Specified Lithium-Ion Battery Project	\$613,783	2/20/2018-2/20/2019

PROPOSALS PENDING

Agency (date)	Title	Amount Status
None		

RECENT TEACHING EXPERIENCE

Advanced Mass Transfer (Graduate), Fall 2015
 Mathematical Modeling of Batteries and Fuel Cells (Graduate), Spring 2016
 Chemical Process Analysis (Graduate), Fall 2016
 Chemical Reactor Design (Graduate), Spring 2017
 Chemical Process Analysis (Graduate), Fall 2017
 Mass Transfer (Undergraduate), Spring 2018
 Chemical Process Analysis (Graduate), Fall 2018

TEACHING EXPERIENCE

Undergraduate

Elementary Chemical Engineering
Chemical Engineering Fluid Operations
Numerical Analysis for Chemical Engineers
Chemical Engineering Heat Transfer Operations
Mathematical Models of Chemical Processes
Chemical Engineering Mass Transfer Operations
Process Control and Instrumentation
Chemical Engineering Kinetics
Chemical Engineering Seminar
Mass Transfer

Graduate

Chemical Engineering Process Analysis
Chemical Engineering Numerical Methods
Chemical Engineering Advanced Mass Transfer
Corrosion and Materials of Construction
Transport Phenomena
Electrochemical Processes
Chemical Reactor Design
Mathematical Modeling of Batteries and Fuel Cells

RESEARCH STUDENTS GRADUATED

Ph.D. 50 M.S. 35 M.E. 4

Ph.D. Students Graduated

1. John Van Zee, Sodium Hydroxide Production in Diaphragm-Type Electrolyzers, *Ph.D.*, Summer, 1984. U. of Alabama
2. Clifford Walton, Modeling of Transport Behavior of Zero Gap/Porous Electrode Membrane Chlor-Alkali Electrolysis Cells, *Ph.D.*, Spring, 1987.
3. Prosper Adanuvor, Model Development and Kinetic Studies of Oxygen Reduction in Alkaline Solutions at a Rotating Disk Electrode, *Ph.D.*, Summer, 1987. Exide
4. Trung Nguyen, Modeling and Characterization of a Lead-Acid Cell, *Ph.D.*, Spring, 1988. U. of Kansas

5. Thomas Evans, Mathematical Modeling of a Zinc/Bromine Flow Cell and a Lithium/Thionyl Chloride Primary Cell, *Ph.D.*, Fall, 1988. DuPont
6. Zhenhua Mao, Electrolysis of Hydrogen Sulfide in Aqueous Solutions and Molten Salts, *Ph.D.*, Spring, 1989. Conoco Phillips
7. Taewhan Yeu, New Secondary Batteries Utilizing Electronically Conductive Polypyrrole Cathode, *Ph.D.*, Fall, 1990. Univ. in Korea
8. Ken-Ming Yin, Mathematical Analysis of the Electrodeposition of Nickel-Chrome Alloys, *Ph.D.*, Spring, 1991. Univ. in Tiawan
9. Bhasker Dave, Oxygen Reduction in Lithium Carbonate Melt: Determination of Electrode Kinetic and Mass Transfer Parameters, *Ph.D.*, Spring, 1991.
10. Eric Kalu, A Study of Li/BrCl₂ in SOCl₂ (Li/BCX) and Zn/Br₂ Cells, *Ph.D.*, Spring, 1991. Florida State
11. Oscar Mendoza, Preparation, Characterization, Surface Chemistry and Corrosion Properties of Ni-TM-P Alloys Produced by Autocatalytic Reduction, *Ph.D.*, Spring, 1991. U. in Mexico
12. Deyuan Fan, Mathematical Modeling of a Sealed Nickel-Cadmium Cell, *Ph.D.*, Summer, 1991. Shell
13. Michael Kimble, Mathematical Modeling of an Alkaline Fuel Cell, *Ph.D.*, Summer, 1991. Kimble and Associates
14. Junbom Kim, Thermal Modeling of a Nickel-Hydrogen Battery, *Ph.D.*, Summer, 1992. U. in Korea
15. Jenn-Feng Yan, Formation of Calcareous Deposits on Cathodically Protected Steel Structures in Seawater, *Ph.D.*, Summer, 1992.
16. Gautam Pillay, Transport through Ion Exchange Membranes, *Ph.D.*, Fall, 1992. West Chester U. of Penn.
17. Guanghong Zheng, Electrodeposition of Thin Films, *Ph.D.*, Fall, 1994. Energizer
18. Pauline De Vidts, Mathematical Modelling of a Nickel/Hydrogen Cell, *Ph.D.*, Summer, 1995. Company in Chile
19. Rick Prieto, Polymer Battery Model, *Ph.D.*, Spring, 1996. Shell
20. Surya Pakalapati, Electrochemical Effects in Graphite Composites, *Ph.D.*, Fall, 1996.
21. Darryl Coleman, Thin Film Zinc Deposition, *Ph.D.*, Fall, 1996.
22. Haraldo Duarte, Pitting Corrosion, *Ph.D.*, Fall, 1996. Shell
23. Dawn See, Ni/H₂ Battery Model, *Ph.D.*, Spring, 1998. Shell
24. Murali Ramasubramanian, Ni-Fe Alloy Plating, *Ph.D.*, Spring, 1998.
25. Pranatharthi Haran Balasubramanian, Electrokinetic Modelling, *Ph.D.*, Summer, 1998. IBM
26. Bradley Johnson, Lithium Ion Battery-Thermal Models, *Ph.D.*, Summer, 1998.
27. Dong Zhang, Investigations of Cathode Materials for Lithium-Ion Batteries: Emphasis on Synthesis and Characterization of Chromium Oxides based Compounds, *Ph.D.*, Summer, 1999.

28. Pankaj Arora, Capacity Fade Studies and High Performance Cathode Materials for Secondary Lithium Batteries, *Ph.D.*, Summer, 1999. DuPont
29. Shannon Baxter, Mathematical Modeling of a Direct Methanol Fuel Cell, *Ph.D.*, Summer, 1999.
30. Ping Yu, Synthesis and Characterization of Anode Materials for Li-ion Batteries, *Ph.D.*, Fall, 1999.
31. Bin Wu, Modeling and Simulation of a Nickel-Hydrogen Cell, *Ph.D.*, Summer, 2000.
32. Gerardine Botte, Thermal Stability and Modeling of Lithium Ion Batteries, *Ph.D.*, Summer, 2000. Ohio University
33. Anand Durairajan, Synthesis and Characterization of Novel Coatings For Corrosion Protection and Hydrogen Embrittlement Inhibition, *Ph.D.*, Summer, 2001.
34. Venkat Subramanian, Simulation and Analysis of Electrochemical Systems, *Ph.D.*, Fall, 2001. U. of Washington
35. Andrew Haug, Development of Low-loading, Carbon Monoxide Tolerant PEM Fuel Cell Electrodes, *Ph.D.*, Spring, 2002. Hamilton Standard
36. Parthasarathy Gomadam, Electrochemical-Thermal Modeling of Lithium-Ion Batteries, *Ph.D.*, Spring, 2003, co-advisor with Dr. John W. Weidner. Medtronic
37. Premanand Ramadass, Capacity Fade Analysis of Commercial Li-Ion Batteries, *Ph.D.*, Summer, 2003. Apple
38. Qingzhi Guo, Modeling of a Polymer Electrolyte Membrane Fuel Cell Cathode, *Ph.D.*, Spring, 2004. Apple
39. Godfrey Sikha, Performance Analysis of Lithium Ion Battery/Electrochemical Capacitor Hybrid Systems, *Ph.D.*, Summer 2005, co-advisor with Dr. Branko N. Popov. Tesla
40. Sheba Devan. Transient Analysis of Intercalation Electrodes for Parameter Estimation, *Ph.D.*, Spring 2006. Apple
41. Shriram Santhanagopalan, Parameter Estimation for Lithium Ion Battery, *Ph.D.*, Fall 2006. NREL
42. Qi, Zhang, Modeling of Lithium Ion Batteries, *Ph.D.*, Fall 2007. Battery company in China
43. Qingbo Dong, Modeling and Kinetic Studies of Oxygen Reduction Reaction in Acidic Solutions at a Rotating Ring Disk Electrode, *Ph.D.*, Fall 2007. FMC
44. Karthikeyan Kumaresan, Theoretical Analysis of the Discharge Performance of Lithium Ion and Lithium/Sulfur Cells, *Ph.D.*, Spring 2008. Acme Battery
45. Sean Rayman, Modeling of Parallel Plate Electrochemical Reactors and Liquid Tin Anode Solid Oxide Fuel Cells, *Ph.D.*, Fall 2009. US Air Force
46. Sindhuja Renganathan, Theoretical Analysis of Stress Generation and Volume Change in Lithium Ion and Lithium Thermal Batteries, Spring 2010. GM India
47. Long Cai, Efficient Modeling of a Lithium Ion Cell Using the Proper Orthogonal Decomposition Method, Fall 2010. Apple
48. Meng Guo, Thermal Models for Lithium-Ion Cells and Batteries, Fall 2011.

49. Saeed Khaleghi Rahimian, Optimization and State Estimation of Li ion cells Using Single Particle Model, Fall 2012. A123
50. Yiling Dai, Studying on Capacity Fade Mechanisms of Li-Ion Batteries through Modeling, Fall 2013. Wilson Greatbatch

Former Ph.D. Students in Academia

1. J. Van Zee, U. of Alabama
2. C. Walton, U. of Nebraska (no longer at U. of Nebraska)
3. T. Nguyen, U. of Kansas
4. K. Yin, Yuan-Ze Institute of Technology, Taiwan
5. E. Kalu, Florida State U.
6. O. Mendoza, the Institute Tecnologica de Saltillo, Mexico
7. J. Kim, U. of Ulsan, Korea
8. G. Botte, Ohio University
9. R. Prieto, U of Puerto Rico-Mayaguez (no longer at U. of Puerto Rico-Mayaguez)
10. Venkat Subramanian, University of Washington, Seattle WA
11. Taewhan Yeu, Chung Ang University, Korea
12. G. Pillay, Western Washington University, Bellingham, WA.

M.S. Students Graduated

1. Mark Edmund, The Mass Transfer and Kinetics for Zinc Deposition from Bromide Media, *M.S.*, Spring, 1980.
2. Raju K. Hirani, The Influence of Chloride Ions on the Corrosion of Copper in Soil, *M.S.*, Spring, 1980.
3. Bruce Blenkarn, Cell Performance of a Miniature Chlorine Diaphragm Cell as a Function of Current Density, Flow, and pH, *M.S.*, Spring, 1981.
4. Susan Lorimer, A Mathematical Model of the Current-Potential Characteristics of the Br₂/Br- Electrochemical System, *M.S.*, Spring, 1982.
5. John Van Zee, The Optimal Thickness of a Br₂ Back-Fed Electrode in a Zn Br₂ Battery, *M.S.*, Fall, 1982.
6. Joseph Holmes, Determination of Bypass Currents in Bipolar Plate Cells Using Finite Elements, *M.S.*, Spring, 1984.
7. Don Wolfe, A Model for Oxygen Reduction in a Gas-Fed Porous Electrode in Caustic Electrolyte, *M.S.*, Summer, 1984.
8. Trung Nguyen, A Mathematical Model for a Parallel Plate Electrochemical Reactor, CSTR, and Associated Recirculation System, *M.S.*, Spring, 1985.
9. Michael Mader, A Mathematical Model of a Zn/Br₂ Cell on Charge, *M.S.*, Summer, 1985.
10. Shiuan Chen, A Mathematical Model for the Electrodeposition of Amorphous Alloys on a Rotating Disk Electrode, *M.S.*, Spring, 1986.

11. William Ryan, A Mathematical Model of a Porous Layer on a Rotating Disk Electrode for the Determination of Current-Potential Characteristics of Corrosion Processes in Aerated Caustic Solutions, *M.S.*, Spring, 1986.
12. Eric Dimpault-Darcy, A Two-Dimensional Mathematical Model of a Porous Lead Dioxide Electrode in a Lead-Acid Cell, *M.S.*, Spring, 1987
13. Rodolfo Morales, Jr., A Description of the Vapor Phase in the Lithium Thionyl Chloride Battery, *M.S.*, Summer, 1988.
14. Stephen Ridge, A Mathematical Model of a Gas-Fed Oxygen Reduction Porous Electrode, *M.S.*, Summer, 1988.
15. Gary Simpson, An Algebraic Model for a Zinc/Bromine Flow Cell, *M.S.*, Summer, 1988.
16. Frederic Jagush, Current Density Distribution Tool, *M.S.*, Spring, 1989.
17. Ralph Fixel, Ni-Cr-P Plating Bath Time Dependent Characterization by Ion Chromatography, *M.S.*, Spring, 1990.
18. Teshome Hailu, The Numerical Solution of a Ni-Cd Battery Modeling Equations Using the Method of Lines, *M.S.*, Fall, 1990.
19. Rahul Bindlish, Electrodeposition of Ni-Cr-P, *M.S.*, Summer, 1991.
20. Donald A. Curtis, A Multipoint Boundary Value Problem Solver with Implicit Time Stepping, *M.S.*, Summer, 1991.
21. Steven Lee, Hydrogen and Oxygen Permeation through Nafion 117 and XUS13204.10 Fuel Cell Membranes, *M.S.*, Spring, 1992.
22. Makoto Kawanami, A Mathematical Model of a Copper Oxide/Copper “Vaporvolt” Cell, *M.S.*, Summer, 1992.
23. Surya Pakalapati, BEM for Cathodic Protection, *M.S.*, Summer, 1992.
24. Mohammed A. Alwohaibi, Determination of Delaminated Area of Coated Steel Using Electrochemical Impedance Spectroscopy, *M.S.*, Fall 1992.
25. Snezana Popova, Corrosion Under Biofilms, *M.S.*, Fall, 1992.
26. Gurmeet Singh, Data Reconciliation and Gross Error Detection, *M.S.*, Fall, 1992.
27. Darryl Coleman, Parallel Plate Electrochemical Reactor, *M.S.*, 1994.
28. Ping Yu, Synthesis and Characterization of Anode Materials for Li-ion Batteries, *M.S.*, 2002.
29. Sheba Devan, Analytical Solution for the Impedance of a Porous Electrode, *M.S.*, Summer, 2003.
30. Sindhuja Renganathan, Polymer Electrolyte Membrane Resistance Model, *M.S.*, Fall, 2005.
31. Venkatasailanathan Ramadesigan, Mathematical Modeling of a Nickel Hydride Cell, *M.S.*, Summer 2008.
32. Deepakkumar Kandasamykarthikeyan, Thermodynamics Model Development for LithiumD Intercalation Electrodes, *M.S.*, Fall 2008
33. Derek Strange, Physics-based Li-SVO Cathode Model, *M.S.*, Summer 2011

34. Tingting Yang, Mathematical Modeling of the LiAl/FeS₂ High Temperature Battery System, *M.S.*, Fall 2011.
35. Eric Walker, Comparison of Particle Filter and Other State Estimation Methods for Prognostics of Lithium-ion Batteries, *M.S.*, Fall 2013.

M.E. Students Graduated

1. Mike Bain, Model Development and Kinetic Studies of Oxygen Reduction in Alkaline Solutions at a Rotating Disk Electrode, *M.E.*, Fall, 1981.
2. Nydia Hurtado, An SMP-Fortran Solver for Systems of Nonlinear Algebraic and Differential Equations Including Two and Three Point Boundary Value Problems, *M.E.*, Summer, 1989.
3. Anand Krishniyer, Thermal Battery Model, *M.E.*, 1999.
4. Dhanwa Thirumalai, Proton Exchange Membrane Fuel Cell Model *M.E.*, 1999.

CURRENT RESEARCH GROUP

Post Doctoral Fellows

Dr. N. Xu (coadvised with Dr. Kevin Huang)
Dr. Paul Coman

PhD Students

Viki Mattick (coadvised with Dr. Kevin Huang), Started Jan 2015
Niloofer Kamyab (coadvised with Dr. John Weidner), Started Aug 2017

MS Students

None