

BIOGRAPHICAL SKETCH

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Professional Preparation

University of Puget Sound, Tacoma, WA	Chemistry	B. S. 1991, with Honors
Cornell University, Ithaca, NY	Organic Chemistry	Ph. D. 1996
University of California, Berkeley, CA	Materials Chemistry	1996-1998

Appointments

University of Rhode Island, Kingston, RI
Professor, 2006-Present
Associate Professor, 2002-2006
Assistant Professor, 1998-2002

University of California, Berkeley, CA
Postdoctoral Fellow, with Professor T. Don Tilley, 1996-1998

Cornell University, Ithaca, NY
Doctoral Dissertation, with Professor David B. Collum, 1991-1996

Awards and Honors

Research Excellence Award, College of Arts and Sciences, University of Rhode Island (2010)
Outstanding Research, Division of Research, University of Rhode Island (2009)
Outstanding Intellectual Property Invention, University of Rhode Island (2008)
Outstanding Intellectual Property Invention, University of Rhode Island (2002)
Outstanding Intellectual Property Invention, University of Rhode Island (2001)
DuPont Teaching Award, Cornell University (1995)
National Institute of Health (NIH) Pre-Doctoral Fellowship, Cornell University (1993 - 1995)
Graduation with Honors in Chemistry (1991)
Best Presentation, Northwest Regional ACS Undergraduate Research Symposium (1991)
National Science Foundation (NSF-PRF) Summer Research Fellowship, University of Utah (1990)
CRC Press Freshman Achievement Award in Chemistry, University of Puget Sound (1989)
University Scholarship, University of Puget Sound (1988 - 1991)

External Funding

Has received over \$7.5 M in external funding and has active research funding in excess of \$5 M from several federal agencies including DOE, NASA, NSF, USDA, and US-DOT and companies including BASF, Procter & Gamble (Duracell), Maxwell Technologies, Kimberly-Clark, and DuPont.

Collaborations & Other Affiliations

Collaborators in the last 48 months: William Euler, Brenton DeBoef, Arijit Bose, Marion Gold (URI), Charles Patrissi (NUWC), Daniel Abraham (Argonne DOE), Vincent Battaglia, John Kerr (LBNL DOE) Boris Ravdel, Frank Puglia (Yardney), Marshall Smart, Kumar Bugga (NASA JPL), Martin Payne (Novolyte), Pardeep Guduru, Vivek Shenoy (Brown Univ.), Arnd Garsuch (BASF), Weishan Li (S. China Univ. Tech.).

PEER REVIEWED RESEARCH PUBLICATIONS:

h-index of 26, manuscripts referenced over 1,700 times

1. Chelate-Assisted Carbon-Halogen Bond Cleavage by Oxidative Addition at a W(0) Carbonyl-Metal Complex, Brett Lucht, Mitchell J. Poss, and Thomas G. Richmond, *J. Chem. Educ.* **1991**, *68*, 786-788.
2. Tungsten(0) Inserts into a Carbon-Fluorine Bond in the Presence of a Carbon-Hydrogen Bond, Brett L. Lucht, Mitchell J. Poss, Margaret A. King, and Thomas G. Richmond, *Chem. Commun.* **1991**, 400-401.
3. Structure of Lithium Hexamethyldisilazide (LiHMDS): Spectroscopic Study of Ethereal Solvation in the Slow-Exchange Limit, Brett L. Lucht and David B. Collum, *J. Am. Chem. Soc.* **1994**, *116*, 6009-6010.
4. Structure of Lithium 2,2,6,6-Tetramethylpiperidide (LiTMP) and 2,2,4,6,6-Pentamethylpiperidide (LiPMP) in Hydrocarbon Solution: Assignment of Cyclic Trimer and Tetramer Conformational Isomers, Brett L. Lucht and David B. Collum, *J. Am. Chem. Soc.* **1994**, *116*, 7949-7950.
5. $^6\text{Li}/^{15}\text{N}$ NMR-based Solution Structural Determination of Et₂O- and TMEDA-solvated Lithium-Phenylacetonitrile and a LiHMDS Mixed Aggregate, Paul R. Carlier, Brett L. Lucht, and David B. Collum, *J. Am. Chem. Soc.* **1994**, *116*, 11602-11603.
6. Ethereal Solvation of Lithium Hexamethyldisilazide (LiHMDS): Unexpected Relationships of Solvation Number, Solvation Energy, and Aggregation State, Brett L. Lucht and David B. Collum, *J. Am. Chem. Soc.* **1995**, *117*, 9863-9874.
7. Lithium Ion Solvation: Amine and Unsaturated Hydrocarbon Solvates of Lithium Hexamethyldisilazide, Brett L. Lucht and David B. Collum, *J. Am. Chem. Soc.* **1996**, *118*, 2217-2225.
8. Solvation of Lithium Hexamethyldisilazide (LiHMDS) by N,N-Dimethylethylenediamine (DMEDA): Effects of Chelation on Competitive Solvation and Mixed Aggregation, Brett L. Lucht and David B. Collum, *J. Am. Chem. Soc.* **1996**, *118*, 3529-3530.
9. Chelating Amine and Ether Solvates of LiHMDS: Relationship of Ligand Structure and Aggregation State, Brett L. Lucht, Max P. Bernstein, Julius F. Remenar, and David B. Collum, *J. Am. Chem. Soc.* **1996**, *118*, 10707-10718.

10. Lithium Diisopropylamide Solvated by Monodentate and Bidentate Ligands: Solution Structures and Ligand Binding Constants, Julius F. Remenar, Brett L. Lucht, and David B. Collum, *J. Am. Chem. Soc.* **1997**, *119*, 5567-5572.
11. Lithium 2,2,6,6-Tetramethylpiperidide (LiTMP) and 2,2,4,6,6-Pentamethylpiperidide (LiPMP): Influence of TMEDA and Related Chelating Ligands on the Solution Structures. Characterization of Higher Cyclic Oligomers, Cyclic Dimers, Open Dimers, and Monomers, Julius F. Remenar, Brett L. Lucht, Dmitriy Kruglyak, Floyd E. Romesberg, James H. Gilchrist, and David B. Collum, *J. Org. Chem.* **1997**, *62*, 5748-5754.
12. A Zirconocene-Coupling Route to Substituted Poly(*p*-phenylenedienylene)s: Bandgap Tuning via Conformational Control, Brett L. Lucht, Shane S. H. Mao, and T. Don Tilley, *J. Am. Chem. Soc.* **1998**, *120*, 4354-4365.
13. Zirconocene-Coupling Routes to Conjugated Polymers: Soluble Poly(arylenedienylene)s, Brett L. Lucht and T. Don Tilley, *Chem. Commun.* **1998**, 1645-1646.
14. Structure of Lithium Monoalkylamides (RHNLi), Katherine B. Aubrecht, Brett L. Lucht, and David B. Collum, *Organometallics* **1999**, *18*, 2981-2987.
15. Lithium Hexamethyldisilazide: A View of Lithium Ion Solvation Through a Glass-Bottom Boat, Brett L. Lucht and David B. Collum, *Acc. Chem. Res.* **1999**, *32*, 1035-1042.
16. Poly(2,5-diphenylgermoles): Incorporation of a Germole Ring into a Conjugated Polymer, Brett L. Lucht, Mihai A. Buretea, and T. Don Tilley, *Organometallics* **2000**, *19*, 3469-3475.
17. Synthesis and Characterization of Poly(*p*-phenylene phosphine)s, Brett L. Lucht and Nicole O. St. Onge, *Chem. Comm.* **2000**, 2097-2098.
18. Transition Metal Mediated Routes to Poly(arylphosphine)s: Investigation of Novel Phosphorus Containing Conjugated Polymers, Zhou Jin and Brett Lucht, *Invited Paper, Journal of Organometallic Chemistry*, **2002**, *653*, 167-176.
19. Electron Donating Properties of *p*-Phenylene Phosphine Imides: An Electrochemical and Spectroscopic Investigation, Marcela Escobar, Zhou Jin and Brett L. Lucht, *Org. Lett.*, **2002**, 2213-2216.
20. Heat Sensitive Polymers Change Color with a Change in Temperature, *Invited Paper, MRS Bulletin*, **2003**, *28*, 100.
21. Thermal Stability of Lithium-Ion Battery Electrolytes, Boris Ravdel, K.M Abraham, Robert Gitzendanner, Joe DiCarlo, Brett L. Lucht and Chris Campion, *J. Power Sources*, **2003**, *119-121*, 805-810.
22. Lithium Hexamethyldisilazide-Mediated Ketone Enolization: The Influence of Hindered Dialkyl Ethers and Isostructural Dialkylamines on Reactions and Mechanisms, Pinjing Zhao, Brett L. Lucht, Sarita L. Kenkre, David B. Collum, *J. Org. Chem.* **2004**, *69*, 242-249.

23. Suppression of Toxic Compounds Produced in the Decomposition of Lithium-Ion Battery Electrolytes, Chris Campion, Wentao Li, William B. Euler, Brett L. Lucht, Boris Ravdel, Joseph Dicarolo, Robert Gitzendanner, and K. M. Abraham, *Electrochem. & Solid-State Lett.* **2004**, 7, A194-A197.
24. Unusual chromic and doping behavior of ether substituted polythiophenes, Yu Wang, William B. Euler, and Brett L. Lucht, *Chem. Comm.* **2004**, 686-687.
25. Observation of Two-Step Thermochromism in Poly(3-docosylthiophene): DSC and Reflection Spectroscopy, Yu Wang, Nadia Archambault, Adrienne Marold, Lucy Weng, Brett L. Lucht, and William B. Euler, *Macromolecules* **2004**, 37, 5415-5422.
26. Hexamethylphosphoramide as a Flame Retarding Additive for Lithium-Ion Battery Electrolytes, Suzette Izquarido-Gonzales, Wentao Li, Brett L. Lucht *J. Power Sources* **2004**, 135, 291-296.
27. Dependence of the Regioregularity of Polythiophenes on Catalyst, Yuxia Mao, Yu Wang, and Brett L. Lucht, *J. Poly. Sci. A: Poly. Chem.* **2004**, 42, 5538-5547.
28. Phosphine Modified Poly-N-aryl-anilines: Synthesis and Properties, Zhou Jin and Brett L. Lucht, *J. Am Chem. Soc.* **2005**, 127, 5586-5595.
29. Thermal Stabilizing Additives for LiPF₆-Carbonate Electrolytes, Wentao Li, Christopher Campion, Brett L. Lucht, Boris Ravdel, and K. M. Abraham *J. Electrochem Soc.* **2005**, 152, A1361-A1365.
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33. Surface Reactions of Lithium Battery Electrolyte with Metal Oxide Cathode Particles, Wentao Li and Brett L. Lucht *J. Electrochem. Soc.* **2006**, 153, A1617-A1625.
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35. Thermal reactions of graphite with LiPF₆ based electrolytes, Ang Xiao, Wentao Li, and Brett L. Lucht *J. Power Sources* **2006**, 162, 1282-1288.
36. Inhibition of the Detrimental Effects of Water Impurities in Lithium Ion Batteries, Wentao Li and Brett L. Lucht *Electrochem. & Solid State Lett.* **2007**, 10, A115-A117.
37. Inhibition of Solid Electrolyte Interface Formation on Cathode Particles for Lithium-Ion Batteries, Wentao Li and Brett L. Lucht *J. Power Sources* **2007**, 168, 258-264.

38. Thermal Reactions of LiPF₆ with added LiBOB: Electrolyte Stabilization and Generation of LiF₄OP, Ang Xiao, Li Yang and Brett L. Lucht *Electrochem. & Solid State Lett.* **2007**, *10*, A241–244.
 39. Investigating the solid electrolyte interphase using binder-free graphite electrodes, S.-H. Kang, D.P. Abraham, A. Xiao, and B.L. Lucht *Journal of Power Sources* **2008**, *175*, 526-532.
 40. Electrochemical characteristics of MCMB and LiNi_xCo_{1-x}O₂ electrodes in electrolytes with stabilizing additives, Smart, M. C.; Lucht, B. L.; Ratnakumar, B. V. *J. Electrochem. Soc.* **2008**, *155*, A557-A568.
 41. Surface analysis of MCMB and LiNi_xCo_{1-x}O₂ electrodes from cells containing electrolytes with stabilizing additives and exposed to high temperature, Li, W.; Xiao, A.; Lucht, B. L.; Smart, M. C.; Ratnakumar, B. V. *J. Electrochem. Soc.* **2008**, *155*, A648-A657.
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 43. Surface reactions and performance of non-aqueous electrolytes with lithium metal anodes, Li Yang, Carl Smith, Charles Patrissi, Christian Schumacher, and Brett L. Lucht *J. Power Sources* **2008**, *185*, 1359-1366.
 44. Examining the Solid Electrolyte Interphase on Binder-free Graphite Electrodes, Ang Xiao, Brett L. Lucht, S.-H. Kang, and D.P. Abraham *J. Electrochem. Soc.* **2009**, *156*, A318-A327.
 45. Investigation of Lithium Tetrafluorooxalatophosphate (LiPF₄C₂O₄) as a Lithium Ion battery Electrolyte, Mengqing Xu, Ang Xiao, Weishan Li and Brett L. Lucht, *Electrochem. & Solid State Lett.* **2009**, *12*, A155-A158.
 46. Effect of Propane Sultone on Elevated Temperature Performance of Anode and Cathode Materials in Lithium Ion Batteries, Mengqing Xu, Weishan Li and Brett L. Lucht, *J. Power Sources* **2009**, *193*, 804-809.
 47. Effect of Mixed Additives on the Performance of Lithium Ion Batteries, Stuart Santee, Ang Xiao, Li Yang, Joseph Gnanaraj and Brett L. Lucht, *J. Power Sources*, **2009**, *194*, 1053-1060.
 48. Inhibition of Electrolyte Oxidation in Lithium Ion Batteries with Electrolyte Additives, Li Yang and Brett L. Lucht, *Electrochem. & Solid State Lett.*, **2009**, *12*, A229-A231.
 49. Effect of Impurities and Moisture on Lithium Bisoxalato borate (LiBOB) Electrolyte Performance in Lithium-ion Cells, Li Yang, M. M. Fuczon, A. Xiao, B. L. Lucht, Z. Zhang, and D. P. Abraham, *J. Power Sources*, **2010**, *195*, 1698-1705.
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50. Investigation of Lithium Tetrafluorooxalatophosphate [LiPF₄(C₂O₄)] as a Lithium Ion Battery Electrolyte for Elevated Temperature Performance, Mengqing Xu, Ang Xiao, Weishan Li, and Brett L. Lucht, *J. Electrochem. Soc.*, **2010**, *157*, A115-A120.
51. Conversion of Cellulose to Glucose and Levulinic Acid via Solid Supported Acid Catalysis, Jessica Hegner, Kyle Pereira, Brenton DeBoef, and Brett L. Lucht, *Tett. Lett.*, **2010**, *51*, 2356-2358.
52. Electrolyte Reactions with the Surface of High Voltage LiNi_{0.5}Mn_{1.5}O₄ Cathodes for Lithium Ion Batteries, Li Yang, Boris Ravdel, and Brett L. Lucht, *Electrochem. & Solid State Lett.*, **2010**, *13*, A95-A97.
53. Investigation of Solvation in Lithium Ion Battery Electrolytes by NMR Spectroscopy, Li Yang, Ang Xiao, and Brett L. Lucht *J. of Mol. Liq.*, **2010**, *154*, 131-133.
54. Experimental and Theoretical Investigations on Dimethyl Vinylene Carbonate as Solid Electrolyte Interface Forming Additive for Lithium-ion Batteries, Mengqing Xu, Liu Zhou, Lidan Xing, Weishan Li, and Brett L. Lucht *Electrochim. Acta*, **2010**, *55*, 6743-6748.
55. Non-flammable Electrolytes for Lithium Ion Batteries, Swapnil Dalavi, Mengqing Xu, Liu Zhou, Boris Ravdel, and Brett L. Lucht *J. Electrochem. Soc.*, **2010**, *157*, A1113-A1120.
56. Two-Step Thermo-chromism in Poly(3-docosoxy-4-methylthiophene): Mechanistic Similarity to Poly(3-docosylthiophene), Dinesh Chalasani, Joshua K. Potvin, Brett L. Lucht and William B. Euler *J. Poly. Sci. A: Poly. Chem.* **2010**, *48*, 4370-4373.
57. Inorganic Additives for Passivation of High Voltage Cathode Materials, Li Yang, Tippawan Markmaitree, and Brett L. Lucht *J. Power Sources* **2011**, *196*, 2251-2254.
58. Comprehensive improvements in Li-ion batteries for demanding applications, M. Gulbinska, G. Moore, S. Santee, B. Lucht, and F. Puglia, *J. Power Sources*, **2011**, *196*, 2899-2904.
59. Investigation and application of lithium difluoro(oxalate)borate (LiDFOB) as additive to improve the thermal stability of electrolyte for lithium-ion batteries, Mengqing Xu, Liu Zhou, Liansheng Hao, Lidan Xing, Weishan Li, and Brett L. Lucht, *J. Power Sources*, **2011**, *196*, 6794-6801.
60. Effects of Different Electrode Materials on the Performance of Lithium Tetrafluorooxalatophosphate (LiFOP) Electrolyte, Liu Zhou, Swapnil Dalavi, Mengqing Xu, and Brett L. Lucht *J. Power Sources* **2011**, *196*, 8073-8084.
61. Investigation of the Solid Electrolyte Interphase on MCMB and NG Electrodes in Lithium Tetrafluorooxalatophosphate [LiPF₄C₂O₄] Based Electrolyte Mengqing Xu, Liu Zhou, Dinesh Chalasani, Swapnil Dalavi, and Brett L. Lucht *J. Electrochem. Soc.* **2011**, *158*, A1202-A1206.

62. Investigation of the Disproportionation Reactions and Equilibrium of Lithium difluoro(oxalato) borate (LiDFOB) Liu Zhou, Wentao Li, Mengqing Xu, Brett Lucht *Electrochem. Solid State Lett.* **2011**, 14, A161-A164.
63. Effect of NaCl on the conversion of cellulose to glucose and levulinic acid via solid supported acid catalysis, Joshua Potvin, Erin Sorlien, Jessica Hegner, Brenton DeBoef and Brett L. Lucht *Tett. Lett.* **2011**, 52, 5891.
64. Effect of added LiBOB on High Voltage(LiNi_{0.5}Mn_{1.5}O₄) Spinel Cathodes, Swapnil Dalavi, Mengqing Xu, Brandon Knight and Brett L. Lucht *Electrochem. Solid State Lett.* **2012**, 15, A28-A31.
65. Performance of Lithium Tetrafluorooxalatophosphate (LiFOP) Electrolyte with Propylene Carbonate, Liu Zhou and Brett L. Lucht *J. Power Sources* **2012**, 205, 439-448.
66. Methylene Ethylene Carbonate: Novel Additive to Improve the High Temperature Performance of Lithium Ion Batteries, Dinesh Chalasani, Jing Li, Nicole M. Jackson, Martin Payne and Brett L Lucht *J. Power Sources* **2012**, 208, 67-73.
67. Performance enhancing electrolyte additives for lithium ion batteries with silicon anodes, Swapnil Dalavi, Pradeep Guduru and Brett L. Lucht *J. Electrochem. Soc.* **2012** 159, A642-646.
68. The Effect of Additives upon the Performance of MCMB/ LiNi_xCo_{1-x}O₂ Li-Ion Cells Containing Methyl Butyrate-Based Wide Operating Temperature Range Electrolytes, M. C. Smart, B. L. Lucht, S. Dalavi, F. C. Krause, and B. V. Ratnakumar *J. Electrochem. Soc.* **2012**, 159, A739-A751.
69. Quantifying Capacity Loss due to Solid-Electrolyte-Interphase Layer Formation on Silicon Negative Electrodes in Lithium-ion Batteries, S. Nadimpalli, V. Sethuraman, S. Dalavi, B. L. Lucht, M. Chon, V. Shenoy, P. Guduru *J. Power Sources* **2012**, 193, 804.
70. Reactivity of Electrolytes for Lithium-Oxygen Batteries with Li₂O₂, Dinesh Chalasani and Brett L. Lucht *ECS Electrochem. Lett.* **2012**, 1, A38.
71. Improved Performance of LiNi_{0.5}Mn_{1.5}O₄ Cathodes with Electrolytes Containing Dimethylmethylphosphonate (DMMP), M. Xu, D. Lu, A. Garsuch, and B. L. Lucht *J. Electrochem. Soc.* **2012**, 159, A2100-A2108.
72. Electrochemical Analysis of Li-Ion Cells Containing Triphenyl Phosphate, R. P. Dunn, J. Kafle, F. C. Krause, C. Hwang, B. V. Ratnakumar, M. C. Smart, and B. L. Lucht, *J. Electrochem Soc.* **2012**, 159, A2130-A2134.
73. Performance of lithium tetrafluorooxalatophosphate in methyl butyrate electrolyte, Liu Zhou, Mengqing Xu, Brett L. Lucht *J. Appl. Electrochem.*, In Press.

74. Lithium ion battery graphite solid electrolyte interphase (SEI) revealed by microscopy and spectroscopy, Mengyun Nie, Dinesh Chalasani, Daniel P. Abraham, Yanjing Chen, Arijit Bose and Brett L. Lucht *J. Phys. Chem. C* **2013**, *117*, 1257-1267.
75. Failure Mechanism of High Voltage Graphite/LiNi_{0.5}Mn_{1.5}O₄ (LNMO) Li-ion Cells at Elevated Temperature, Dongsheng Lu, Mengqing Xu, Liu Zhou, Arnd Garsuch, and Brett L. Lucht *J. Electrochem Soc.* **2013**, *160*, A3138-A3143.
76. Silicon Solid Electrolyte Interphase (SEI) of Lithium Ion Battery Characterized by Microscopy and Spectroscopy, Mengyun Nie, Daniel Abraham, Yanjing Chen, Arijit Bose, and Brett L. Lucht *J. Phys. Chem. C* **2013**, *117*, 13403-13412.
77. Improving the Performance of Graphite/ LiNi_{0.5}Mn_{1.5}O₄ Cells at High Voltage and Elevated Temperature with added Lithium bis(oxalato) borate (LiBOB), Mengqing Xu, Liu Zhou, Yingnan Dong, Yanjing Chen, Arnd Garsuch, and Brett L. Lucht *J. Electrochem. Soc.* **2013**, *160*, A2005-A2013.
78. Surface Study of Electrodes after Long-Term Cycling in Li_{1.2}Ni_{0.15}Mn_{0.55}Co_{0.1}O₂-Graphite Lithium-ion Cells, Xiaobo Li, Mengqing Xu, Yanjing Chen, Brett L. Lucht *J. Power Sources* **2014**, *284* 1077-1084.

BOOK CHAPTERS:

1. *Thermal Stability of Lithium Ion Battery Electrolytes* Brett L. Lucht, Tippawan Markmaitree, and Li Yang in *Energy Production and Storage - Inorganic Chemical Strategies for a Warming World*, Ed. Robert Crabtree, John Wiley & Sons, **2011**, pp 333-340.
2. *Electrolytes for High Voltage Batteries* Mengqing Xu, Swapnil Dalavi, and Brett L. Lucht in *Advanced Lithium Ion Batteries*, John Wiley & Sons, **2012**, *In Press*.

PATENTS:

1. Thermo-chromic Polymers for Rapid Visual Assessment of Temperature, Brett L. Lucht, William B. Euler, and Otto J. Gregory, US 6,706,218, March 16, 2004.
2. Thermo-chromic Indicator Materials with Controlled Reversibility, Brett L. Lucht, William B. Euler, and Yu Wang, US 7,517,475 B2, April 14, 2009.
3. Thermofluorescent Pigments for Security and Safety Applications, Brett L. Lucht, William B. Euler, Nadia Archambault and Yu Wang US 7,833,438 Issued Nov. 16, 2010
4. Thermo-chromic Indicator Material with Controlled Reversibility, Brett L. Lucht and William B. Euler, US 7,943,063, May 17, 2011.
5. Novel Electrolyte for Lithium Batteries, Brett L. Lucht, Ang Xiao, and Li Yang, US 8,334,404 Issued December 18, 2012.

6. Inhibition of Electrolyte Oxidation with Electrolyte Additives, PCT Patent Application, PCT Int. Appl. (2010), WO 2010003069 A1 20100107.