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Jim Zhang, Ph.D.

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Professional Profile

Dr. Zhang has extensive expertise in the field of batteries, including failure analysis, quality assessment, and battery safety management. He has years of experience in battery electrolyte design and additive screening. Dr. Zhang specializes in chemical/electrochemical stabilization and characterization of electrolyte/electrode interphase for anode and cathode. He is also experienced in cell-level validation and compatibility evaluation as well as raw materials chemistry and analysis.

Dr. Zhang is also versed in manufacturing quality and process control. Dr. Zhang works extensively on projects related to battery internal short detection, including destructive and non-destructive analytical techniques.

For his Ph.D. thesis, Dr. Zhang performed fundamental research on lithium metal batteries. His research focused on lithium metal battery failure mechanism analysis and electrolyte design for high-performance batteries. Through his research he is experienced in lithium metal foil and pouch cell manufacturing, cell testing, lithium dendrite prevention by chemical and engineering methods, cell failure mode identification, and high energy cell destructive post mortem analysis.

Academic Credentials & Professional Honors

Ph.D., Materials Science and Engineering, University of California, Riverside, 2021

B.S., Materials Science and Engineering, Zhejiang University, China, 2016

Licenses and Certifications

Certified ISO 9001:2000 Lead Auditor

Prior Experience

Engineering Scientist, Cuberg Inc, 2021-2022

Graduate research assistant, University of California, Riverside, 2016 – 2021

Graduate teaching assistant, University of California, Riverside, 2017

Languages

Mandarin Chinese

Publications

Zhang J, Shi J, Gordon L.W, Shojarazavi N, Wen X, Zhao Y, Chen J, Su C.C, Messinger R.J, Guo J. Performance Leap of Lithium Metal Batteries in LiPF6 Carbonate Electrolyte by a Phosphorus Pentoxide Acid Scavenger. ACS Applied Materials & Interfaces. 2022, 14, 36679–36687.

Zhang J, Zhou M, Shi J, Zhao Y, Wen X, Su C.C, Wu J, Guo J. Regulating lithium deposition via electropolymerization of acrylonitrile in rechargeable lithium metal batteries. Nano Energy, 2021, 88, 106298.

Zhang J, Shi J, Wen X, Zhao Y, Guo J. Properties of thin lithium metal electrodes in carbonate electrolytes with realistic parameters. ACS applied materials & interfaces, 2020, 12(29), 32863-32870.

Zhao Y, Zhang J, Guo J. Cathode–Electrolyte Interfacial Processes in Lithium‖ Sulfur Batteries under Lean Electrolyte Conditions. ACS Applied Materials & Interfaces, 2021, 13(27), 31749-31755.

Wen X, Zhang J, Luo H, Shi J, Tsay C, Jiang H, Lin Y.H, Schroeder M.A, Xu K, Guo J. Synthesis and Electrochemical Properties of Aluminum Hexafluorophosphate. The Journal of Physical Chemistry Letters, 2021, 12(25), 5903-5908.

Liu T, Lv G, Liu M, Zhao C, Liao L, Liu H, Shi J, Zhang J, Guo J. Cation-intercalation and conversion-type cathode materials for rechargeable aluminum batteries. Materials Chemistry Frontiers, 2022, 6, 280-296.

Wen X, Yu Z, Zhao Y, Zhang J, Qiao R, Cheng L, Ban C, Guo J. Enabling magnesium anodes by tuning the electrode/electrolyte interfacial structure. ACS Applied Materials & Interfaces, 2021, 13(44), 52461-52468.

Sun C.C, He M, Shi J, Amine R, Zhang J, Guo J, Amine K. Superior long-term cycling of high-voltage lithium-ion batteries enabled by single-solvent electrolyte. Nano Energy, 2021, 89, 106299.

Su C.C, He M, Shi J, Amine R, Zhang J, Amine K. Solvation Rule for Solid-Electrolyte Interphase Enabler in Lithium-Metal Batteries. Angewandte Chemie, 2020, 132(41), 18386-18390.

Shi J, Zhang J, Guo J, Lu J. Interfaces in rechargeable magnesium batteries. Nanoscale Horizons, 2020, 5(11), 1467-1475.

Rezaie A.A, Yan Z, Scheifers J.P, Zhang J, Guo J, Fokwa B.P. Synthesis and Li-ion electrode properties of layered MAB phases Ni n+ 1 ZnB n (n= 1, 2). Journal of Materials Chemistry A, 2020, 8(4), 1646-1651.

Wen X, Liu Y, Jadhav A, Zhang J, Borchardt D, Shi J, Wong B.M, Sanyal B, Messinger R.J, Guo J. Materials compatibility in rechargeable aluminum batteries: chemical and electrochemical properties between vanadium pentoxide and chloroaluminate ionic liquids. Chemistry of Materials, 2019, 31(18), 7238-7247.

Shi J, Zhang J, Guo J. Avoiding pitfalls in rechargeable aluminum batteries research. ACS Energy Letters, 2019, 4(9), 2124-2129.

Shi J, Zhang J, Zhao Y, Yan Z, Hart N, Guo J. Synthesis of Li2S-carbon cathode materials via carbothermic reduction of Li2SO4. Frontiers in Energy Research, 2019, 7, 53.

Jay R, Tomich A.W, Zhang J, Zhao Y, De Gorostiza A, Lavallo V, Guo J. Comparative study of Mg (CB11H12) 2 and Mg (TFSI) 2 at the magnesium/electrolyte interface. ACS Applied Materials & Interfaces, 2019, 11(12), 11414-11420.

Geng L, Scheifers J.P, Zhang J, Bozhilov K.N, Fokwa B.P, Guo J. Crystal structure transformation in Chevrel phase Mo6S8 induced by aluminum intercalation. Chemistry of Materials, 2018, 30(23), 8420-

8425.

Hart N, Shi J, Zhang J, Fu C, Guo J. Lithium Sulfide–Carbon Composites via Aerosol Spray Pyrolysis as Cathode Materials for Lithium–Sulfur Batteries. Frontiers in chemistry, 2018, 6, 476.

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Fu C, Li G, Zhang J, Cornejo B, Piao S.S, Bozhilov K.N, Haddon R.C, Guo J. Electrochemical lithiation of covalently bonded sulfur in vulcanized polyisoprene. ACS Energy Letters, 2016, 1(1), 115-120.

Presentations

Zhang J, Guo J. Properties of thin lithium metal electrode in electrolytes based on carbonate solvents. Oral presentation, ACS Fall 2019 National Meeting & Exposition, San Diego, CA, 2019.

Zhang J, Guo J. Properties of Thin Lithium Metal Electrode in Carbonate Electrolytes. Poster presentation, 236th ECS Meeting, Atlanta, GA, 2019.

Zhang J, Guo J. Properties of Thin Lithium Metal Electrode in Carbonate Electrolytes. Poster presentation, International Battery Association (IBA) 2019, San Diego, CA, 2019.

Editorships & Editorial Review Boards

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