Postdoctoral Researcher, Materials Science & Engineering, Stanford University

Novel Battery Cathode Material Synthesis & Exploration

Description
Will Chueh is an Associate Professor in the Department of Materials Science & Engineering, a Senior Fellow of the Precourt Institute for Energy, and the co-director of the StorageX Initiative at Stanford University. He leads a research group of 40 tackling the challenge of decarbonizing various energy transformation pathways. The Chueh group is currently seeking a postdoctoral researcher to lead a new research effort exploring novel positive electrode compositions and structures for lithium ion batteries that have been targeted as a result of recent fundamental studies on oxygen redox within the group. The scientist will utilize synthesis and automated process equipment to assemble and optimize ~100g synthesis capabilities, utilizing facilities at Stanford and SLAC National Accelerator Laboratory. The ideal candidate will have a strong transition metal oxide synthesis background and a drive to apply their experience while learning from industrial collaborators to perform world-leading materials synthesis research. The researcher will apply these cutting-edge capabilities to explore exciting new positive electrode compositional spaces that have been identified as promising targets for next generation, high energy density intercalation electrodes. Intended outcomes of the research are patents, publications, and industrial adoption. This role represents a unique opportunity to gain industry-level R&D experience while working on an ambitious new synthesis project in a creative, flexible academic setting.

Key Responsibilities
- Coordinate the assembly, operation, optimization, and maintenance of ~100g coprecipitation reactors with automated process control to achieve reproducible mixed transition metal cathode precursors (carbonates and hydroxides) with a high degree of control over particle size and morphology
- Optimize calcination of precursors with lithium sources to synthesize layered transition metal oxides with high volumetric energy density and controlled atomic/mesoscale structure
- Innovate coprecipitation and calcination processes to maximize control and reproducibility of layered oxide materials properties
- Work closely with industrial contacts to ensure process meets industry standards
- Extended travel to industrial collaborator facilities to gain hands-on experience with industry-grade synthesis procedures and standards
- Generate SOPs and ensure adequate knowledge transfer of synthetic protocols within the research group
- Collaborate in interdisciplinary teams to apply advanced characterization methods (diffraction, tomography, etc. both synchrotron- and lab-based) to the synthesized materials to quantitatively understand effect of synthesis parameters on atomic/mesoscale structures
- Validate materials through high precision electrochemical measurements in half- and full-cell coin cells
• Interface with internal and external support personnel to ensure minimal equipment downtime and maximum operational reproducibility

Required Skills and Background
• PhD in Materials Science, Chemical Engineering, Chemistry, or similar
• 3+ years relevant experience (including doctoral research) in transition metal oxide synthesis, coprecipitation reactions, and/or related syntheses
• Strong ability to perform multi-disciplinary research and integrate a broad range of scientific and engineering disciplines
• Quick learner able to innovate with new equipment, processes, and techniques to tackle complex research problems
• Experience with standard materials characterization techniques such as XRD, ICP, SEM
• Exceptionally strong communication and collaboration skills
• Desire to work in a highly collaborative goal-oriented team

Desired Skills and Background
• Strong working knowledge of lithium ion batteries and electrochemistry
• Experience and understanding of automated process control
• Experience with battery electrode fabrication and cell assembly
• Experience with synchrotron-based X-ray techniques

All qualified applicants will receive consideration for employment without regard to race, sex, color, religion, sexual orientation, gender identity, national origin, protected veteran status, or on the basis of disability.

To inquire further please send a resume/CV and list of publications to Will Gent at will.gent@stanford.edu