



Startup: Volexion

Startup Website: www.volexion-inc.com

Startup Description:

Volexion is an advanced materials startup and Northwestern University spin-out that commercializes a "drop-in" graphene encapsulation technology designed to stabilize and protect lithium-ion battery cathodes. By wrapping individual cathode particles in a conformal, nanoscale layer of pristine graphene, the company's research focuses on mitigating the chemical degradation and side reactions that typically occur at the cathode-electrolyte interface, thereby enabling the use of high-energy, nickel-rich, or cobalt-free chemistries that are otherwise too unstable for commercial use. This dual-purpose coating serves as both a chemical shield and a highly conductive additive, with the company currently scaling its manufacturing process to deliver batteries with up to 30% higher energy density and a 3x improvement in cycle life.

Project Title:

Development and Optimization of Graphene Coatings on Cathode Active Materials for Energy Storage Applications

Project Description:

This project focuses on the end-to-end development of advanced energy storage materials, specifically investigating the production, characterization and electrochemical validation of graphene-based protective coatings. The intern will explore scalable exfoliation of graphite into high-purity, conductive nanosheets and their subsequent application in the conformal encapsulation of high-energy cathode powders. The research will bridge the gap between material processing and device performance by employing analytical electrochemistry including impedance spectroscopy and cycling stability tests to quantify how these 2D interfaces mitigate electrolyte degradation and enhance power density at the particle level.

Project Expectations:

Participation in this internship requires a high degree of autonomy and a startup-first mindset. The intern will be expected to transition from supervised training to independent project ownership. You will be expected to maintain laboratory records, translating complex lab observations into clear technical reports that directly inform our R&D efforts and progress our road-map. Beyond basic lab proficiency in chemical handling and processing, we expect an active contribution to our problem-solving culture. This means not only executing established protocols but also identifying areas for improvement and proposing iterative experimentation. Success in this role is defined by the ability to balance precision adaptability to real-time results. A final presentation will be prepared to share your work and findings with internal team and at the Summer Scholars event before the new school year.



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Desired Candidate Experience:

- Currently pursuing a BS, MS, or PhD in Materials Science, Chemical Engineering, Chemistry, or a related field
- Hands-on lab experience with nanomaterial handling or chemical synthesis
- Familiarity with battery testing equipment and basic electrochemical principles
- Strong data analysis skills and the ability to work in a fast-paced startup environment.

Training & Mentoring Opportunities:

Direct Access to Senior R&D: You'll be paired with a lead PhD Battery Scientist for weekly 1-on-1s to troubleshoot experiments and review electrochemical data in real-time.

Full Lab Immersion: We don't just hand you a protocol you will be in the lab doing the development and reporting your findings. Your work will be iterative not, just repetitive.

Deep Technical Introspection: The project starts with a deep dive into our proprietary graphene chemistry and a literature review so you understand exactly how your work fits into the company's road-map.

The "Startup Toolkit": Beyond the lab, we focus on professional skills learning how to work and operate in a professional lab environment and navigate the day to day activities and planning.

Communication Coaching: You'll be expected to present your progress to the team, with active coaching on how to translate raw lab results into clear technical insights for both scientists and partners.

Performance Benchmarking: We value transparency. You'll have a mid-summer check-in and a final written evaluation focused on your growth in problem-solving and collaborative engineering.