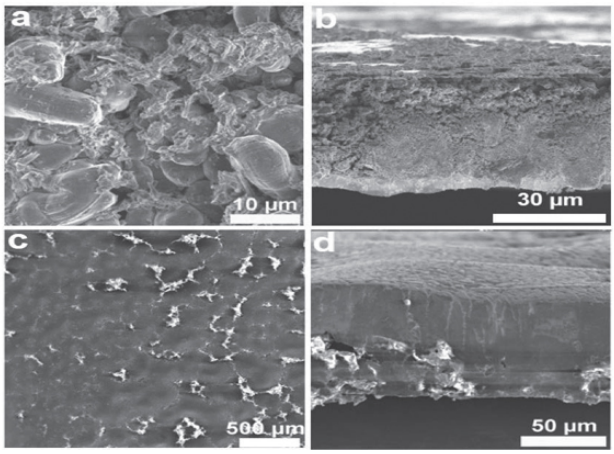
High-Performance Lithium Metal Anode for High-Energy Batteries

ID# 2017-4677



Li Deposits on Cu Foil & Sponge

Technology Summary

A large scale, commercially viable, three-dimensional sponge-hosted Li metal anode with tunable thickness through electrodeposition. Due to the unique properties of the three-dimensional polymer sponge, uniform Li metal deposition with high CE (>99.2%) can be achieved at high deposition capacity (4 mAh cm-2) and current density (45 mA cm-2) for 500 cycles. Full cells using 3D sponge hosted Li metal anodes will be produced. The overall approach will focus on development and optimization of preparation methods and electrodeposition conditions. This work will also be accompanied by chemical/physical property measurement and characterization (morphology, mechanical properties) for the 3D sponge hosted Li metal, along with cell testing.

Application & Market Utility

The lithium metal anode proposed here shows lower production cost and better battery performance. Our competitive advantage concerning both price and performance will allow us to bring this advanced research to real-world production of high-performance Li metal anodes and high-energy lithium metal batteries.

Next Steps

Seeking research collaboration and licensing opportunities.

TECHNOLOGY READINESS LEVEL 1-3

Seeking

Licensing | Research

Keywords

- Battery
- Li metal anode
- Lithium Metal Batteries

Researchers

Donghai Wang
Assistant Professor, Mechanical Engineering
Online Bio

Guoxing Li

Originating College
College of Engineering

Office of Technology Management Contact
Douglas Gisewhite
drg206@psu.edu
814.865.6961

Invent Penn State is a Commonwealth-wide initiative to spur economic development, job creation, and student career success. Invent Penn State blends entrepreneurship-focused academic programs, business startup training and incubation, funding for commercialization, and university-community collaborations to facilitate the challenging process of turning research discoveries into valuable products and services that can benefit Pennsylvanians and humankind. Learn more at invent.psu.edu.

Penn State is an equal opportunity, affirmative action employer, and is committed to providing employment opportunities to all qualified applicants without regard to race, color, religion, age, sex, sexual orientation, gender identity, national origin, disability or protected veteran status.