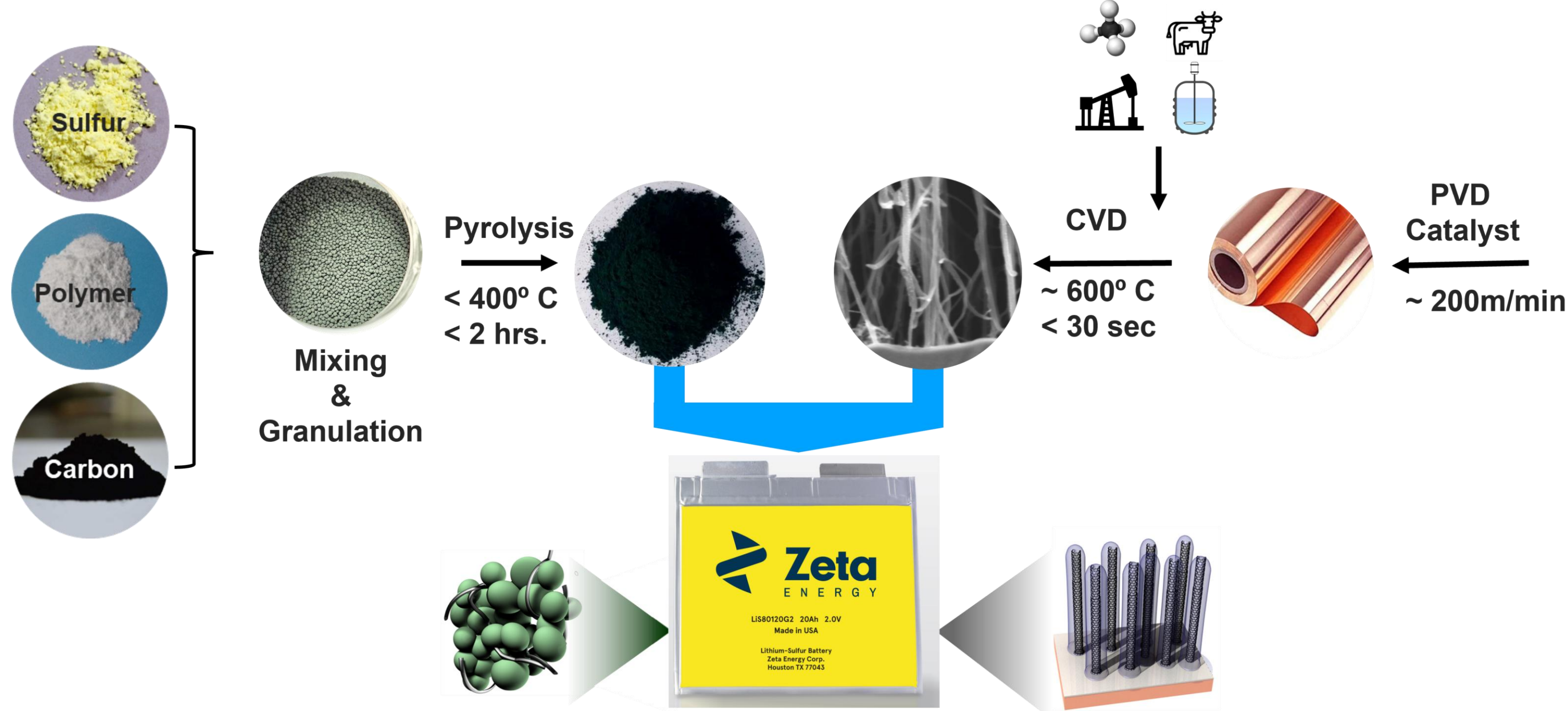


A Novel Breakthrough Technology for Low Cost LiS Battery Systems

Yes – Lithium Sulfur, but not your father's version



Note: This site in Canada process the equivalent of 1.6TWh of Zeta batteries per year. One of many sites.

CATHODE: Three precursor (3) materials make up the cathode:

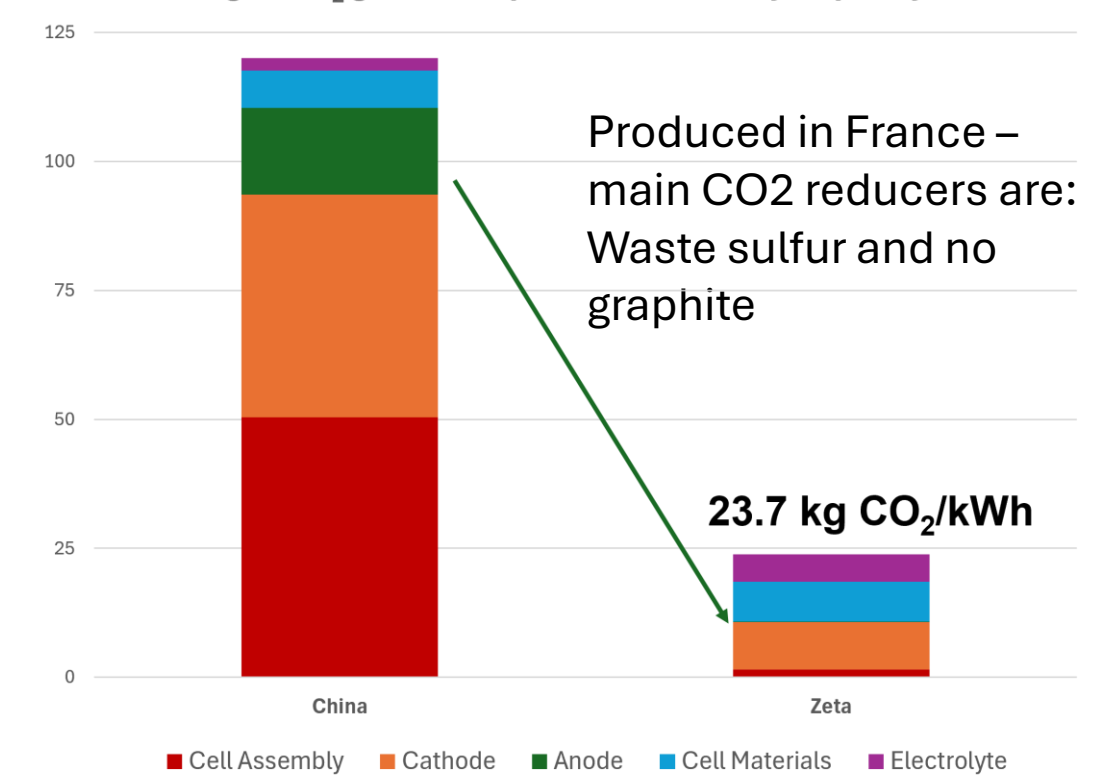
Sulfur – An inexpensive, abundant material produced at a refinery near you (Europe > 100 refineries)

- No mining, no child labor, no shipping around the world, shortest supply chain
- CO₂ neutral
- Zeta requires no post processing – from the refinery to the reactor

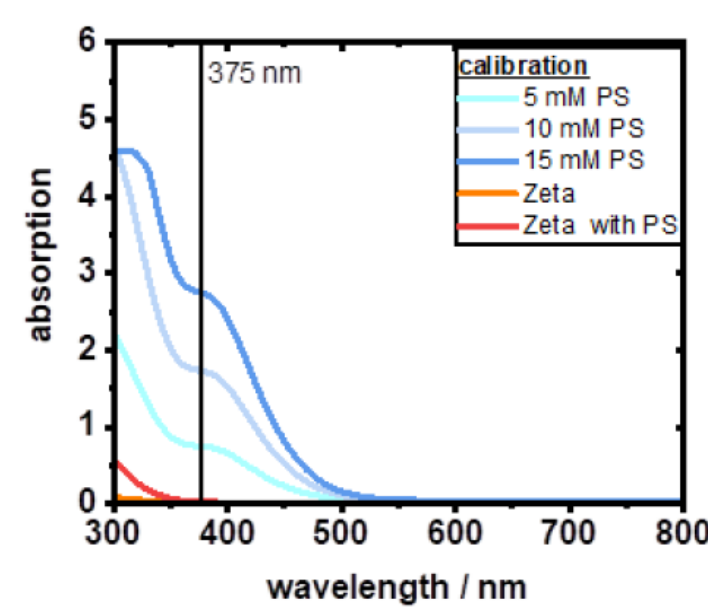
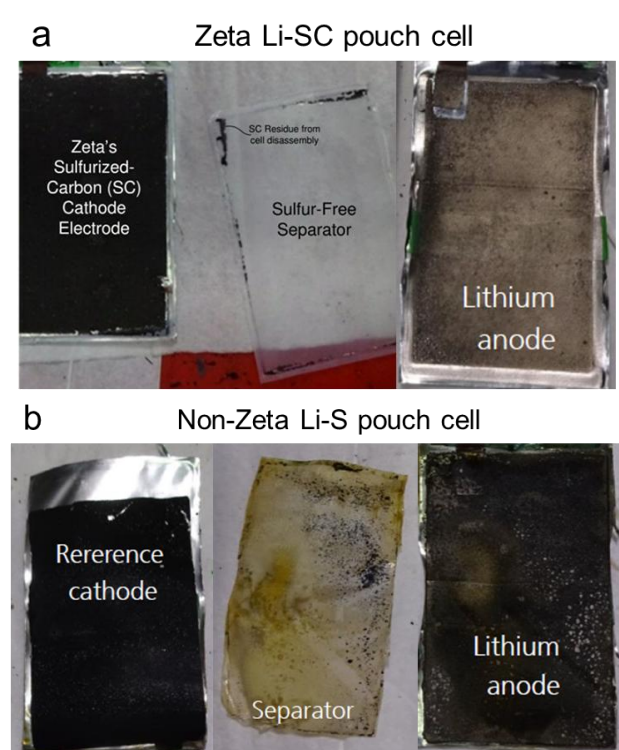
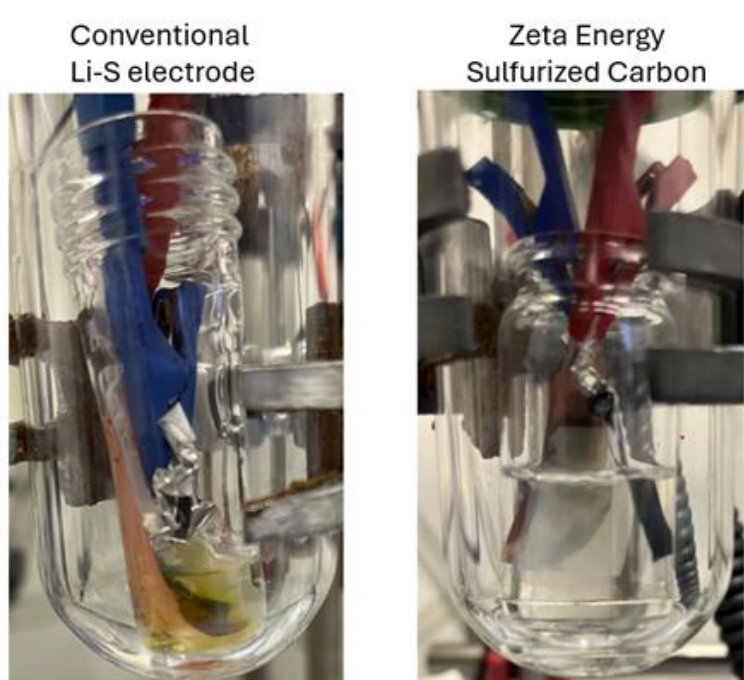
Polymer – A material widely used in the textile and many other industries

Carbon – A carbon additive made from methane (goodbye greenhouse gas)

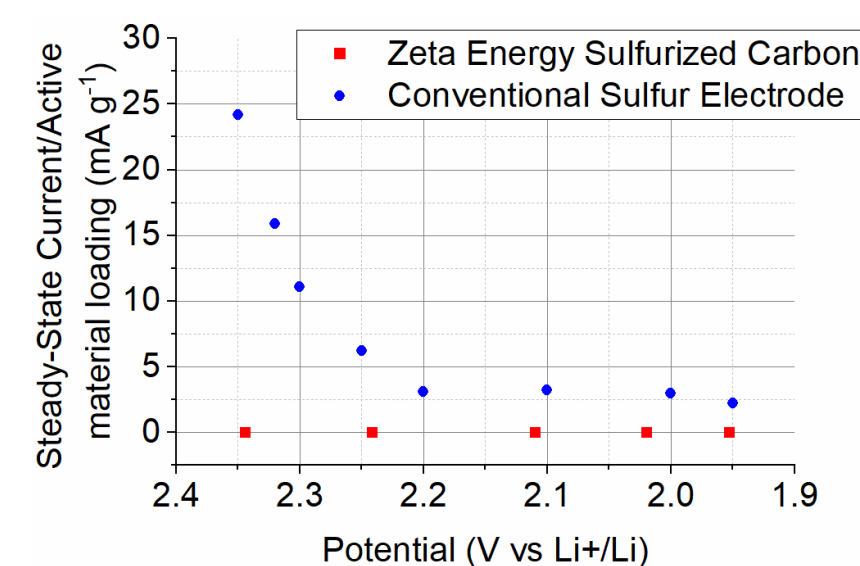
Kg of CO₂ generated per kWh of Battery Capacity



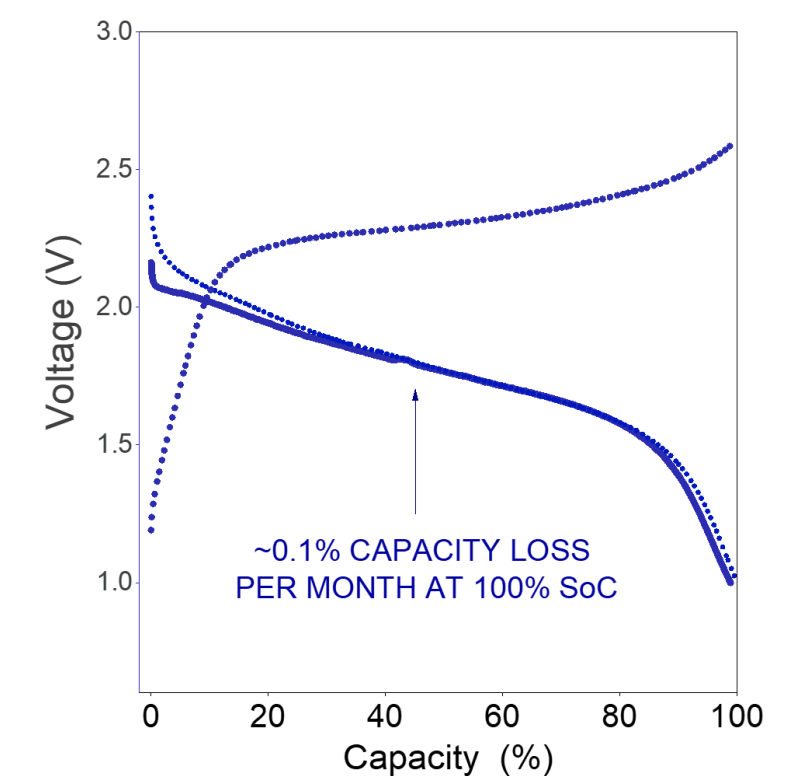
No Free Polysulfides



Note: Orange Line: Zeta electrolyte – no PS detected

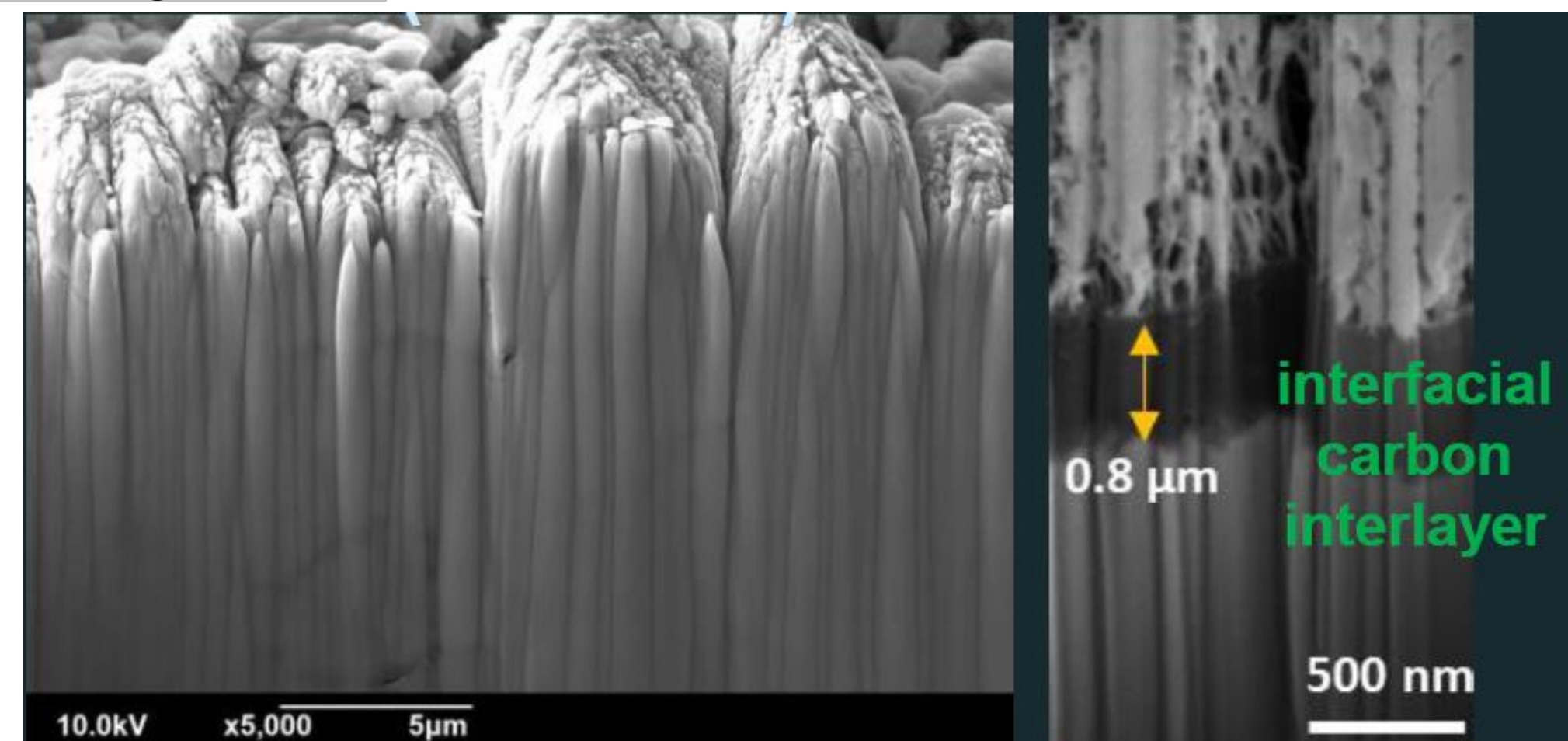
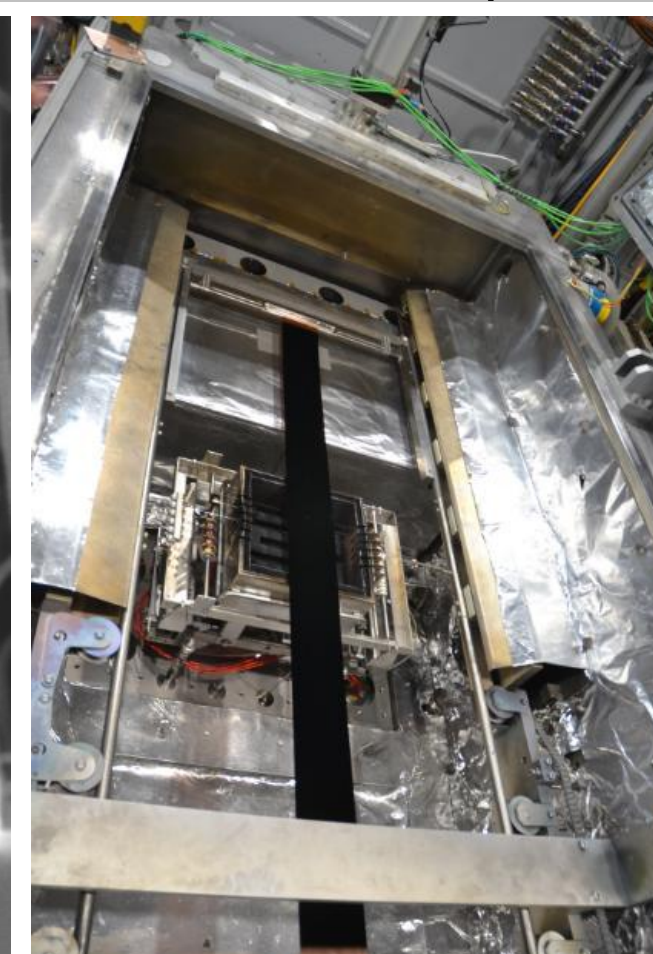
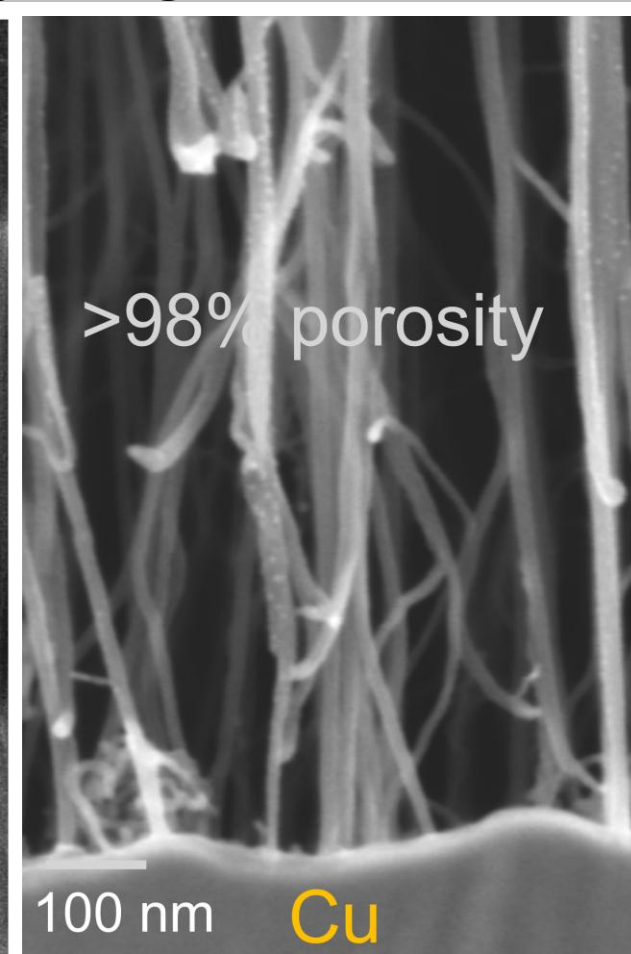
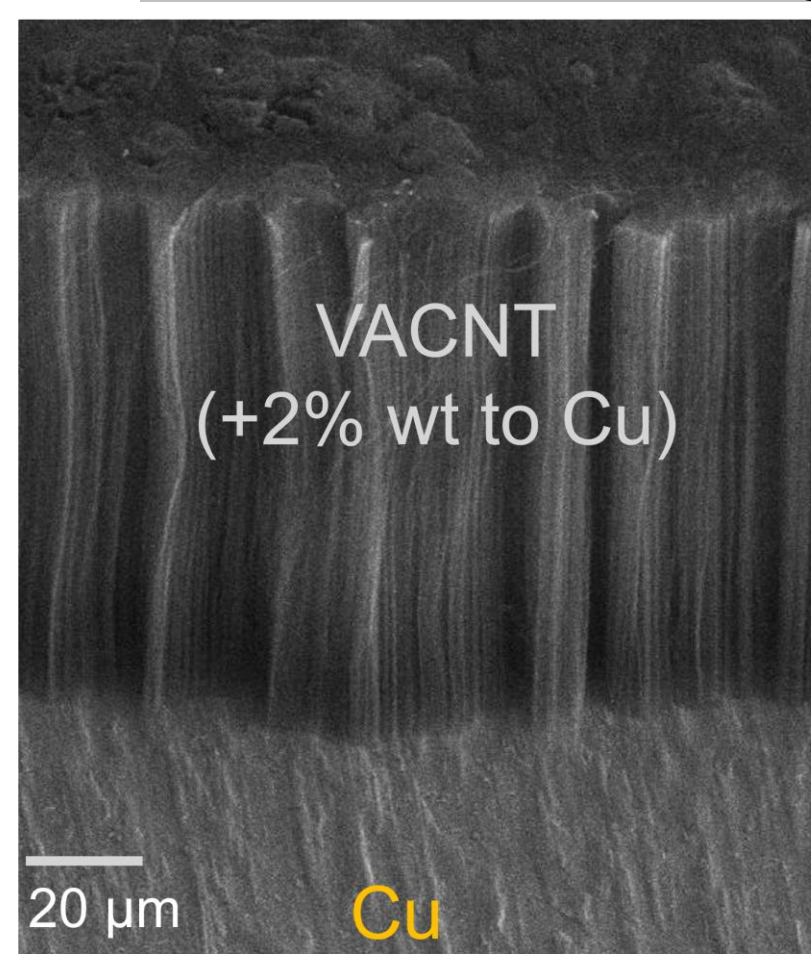


No electrochemical presence of polysulfide shuttling is present in Zeta Energy Cell



No double plateau, discharge analog to NMC
Low self discharge <math>< 2\%</math> / year

ANODE: Vertically Aligned Carbon Nanotubes (VACNTs) hosting lithium



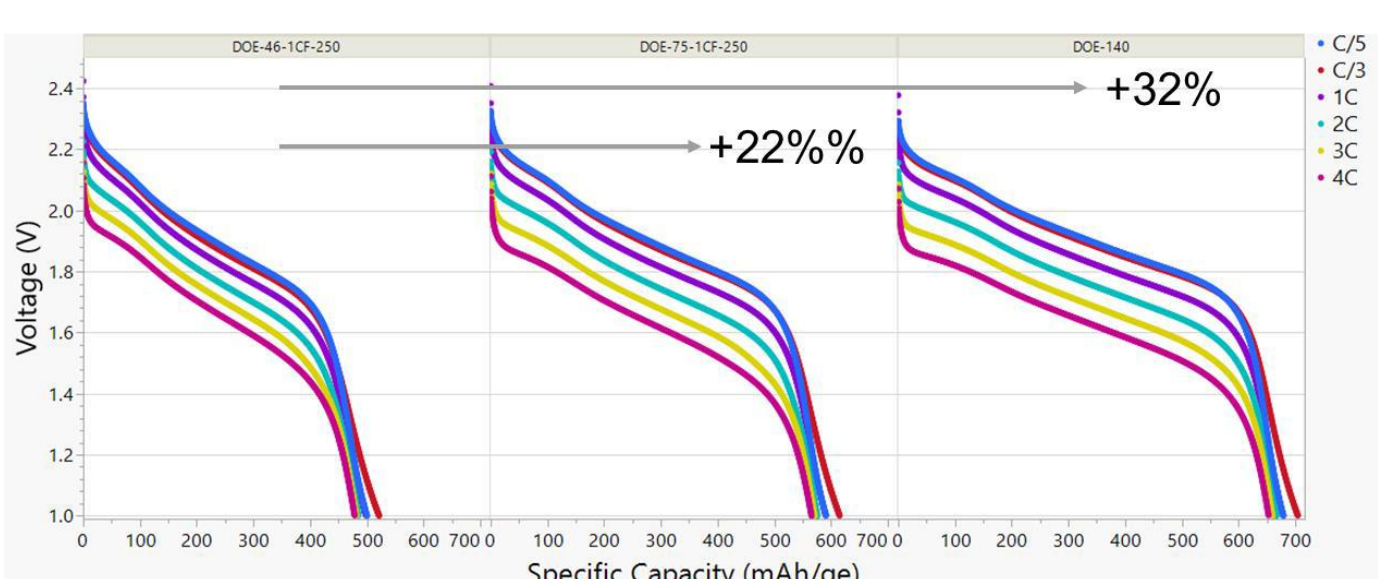
VACNT on metal CC (Cu)

- 3D structure
- >90% porosity for Li + SEI incorporation
- Independent control of height and density
- Engineered Cu/VACNT interface, <math>< 30</math> seconds growth

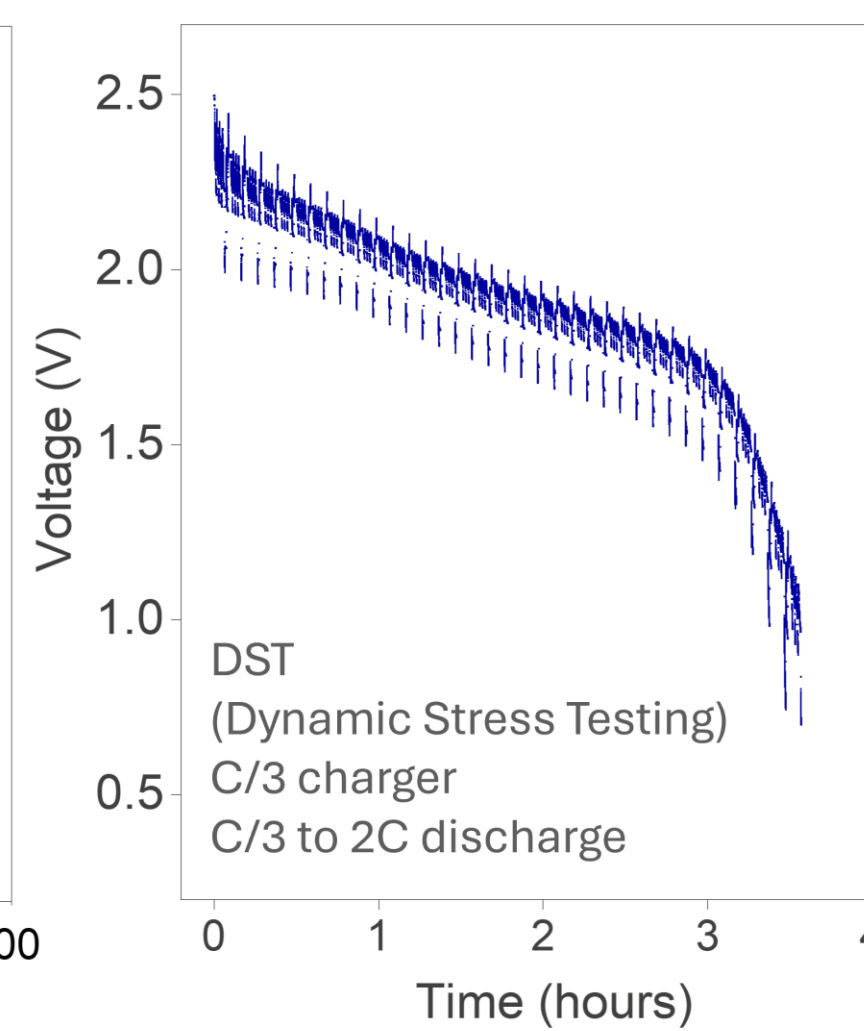
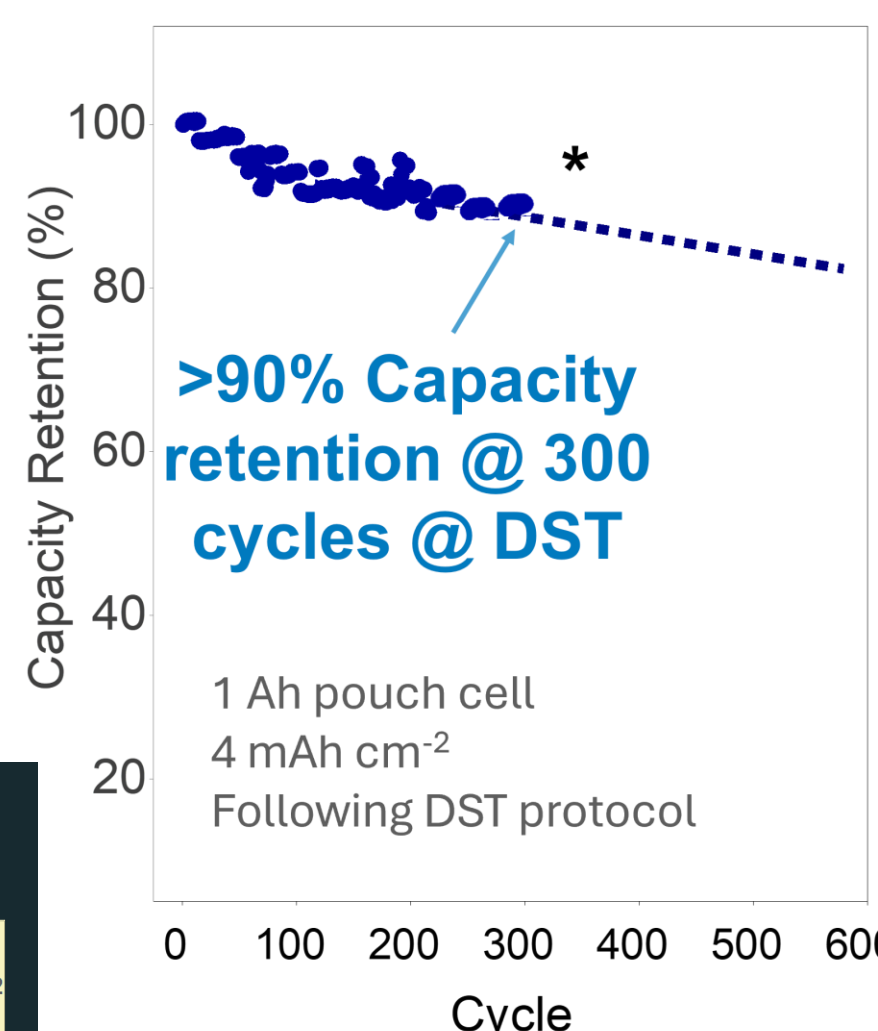
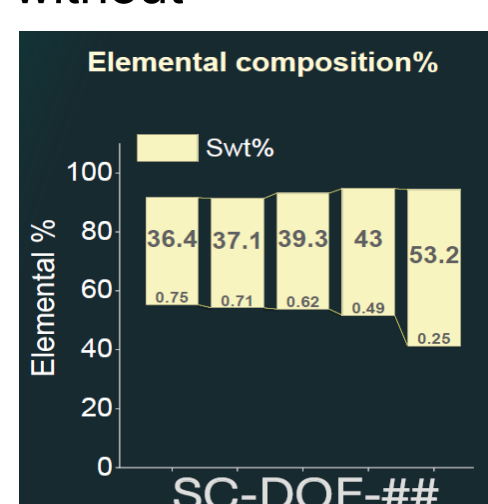
1.4 m double-sided coated VACNT on Cu

Li-VACNT on metal CC (Cu)

- >15 mAh/cm² (Li hosted by VACNT)
- Porosity control
- 3D SEI
- NP<math>< 3</math> (at 5 mAh/cm²), Enhanced adhesion for Li metal



Engineered porosity in carbon structures trap sulfur physically, while covalent bonding stabilizes it chemically—allowing high sulfur content without performance trade-offs



Zeta Li-S Cell:

- Lowest CO₂ Footprint
- Shortst Supply Chain
- No critical materials such as
 - Ni, Co, Mn
 - Graphite

Sulfurized Carbon cathode compatible:

- Li-metal anodes
- Silicon
- Graphite
- Lowest cost per kWh for high volume markets such as EVs, grid
- Highest energy for defense, drone, etc.

