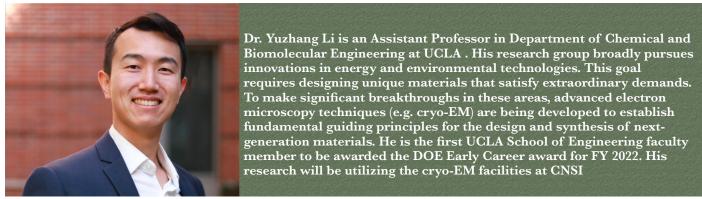
Ultrafast Electrodeposition Of Faceted Li Metal Polyhedra

Electrochemical deposition of metals with precise morphological and chemical control is of fundamental importance to a broad range of electrochemical systems, including energy storage, large scale manufacturing, electronics, and electrocatalysis. For non-reactive metals (e.g. Ni, Pt), electroplating is a commercially established process that gives the desired control of deposition morphology and chemistry. However, deposition of reactive metals (e.g. Li, Na) critical for enabling next-generation batteries is complicated by metal surface corrosion that occurs concurrently with metal deposition, making such electrodeposition processes neither well-understood nor well-controlled. This work highlights the electrodeposition of lithium (Li), a reactive metal anode plagued with uncontrolled dendritic morphologies and surface corrosion, both of which are intimately linked and occur simultaneously. Despite tremendous research efforts to mitigate these issues, common literature descriptions of Li metal deposits (e.g. "chunky", "pancake") and their corrosion films (e.g. "strong", "stable") are ill-defined and often qualitative, highlighting our incomplete understanding of the deposition process and hindering the practical application of high energy battery chemistries enabled by Li metal. Our work seeks to bridge this critical gap in understanding by solving the fundamental challenge of (1) decoupling simultaneous electrodeposition from surface corrosion of reactive metals and (2) observing their reactive nanoscale interface.



PTF Webinar Series on emerging technologies that are shaping the future of particle technology. We are inviting distinguished experts who will shed light on various emerging technologies. The goal of these webinar series is to excite the undergraduate and graduate students to get into particle technologies and prepare themselves for future job opportunities



Tuesday, February 11th 2025 at 11 AM CST Register at <u>https://qrco.de/ptfwebinar</u> Or scan QR code

