

UNIVERSITY OF RHODE ISLAND
Department of Chemistry
SEMINAR

Room 105 Beupre Center
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Zachary Brown

Graduate Student
Chemistry Department
URI

**“Development of Carbonate Electrolytes
for Lithium Metal Electrodes”**

HOST

Jason Dwyer
Department of Chemistry
401-874-4648

Development of Carbonate Electrolytes for Lithium Metal Electrodes

The development of energy storage technology is an important topic for facilitating the employment of renewable energy in society. Therefore, current energy storage research is heavily focused on enabling rechargeable high-energy density lithium-based batteries. In particular, permitting reversible electrochemical plating and stripping of the lithium metal electrode in carbonate electrolytes can achieve this goal. Unfortunately, the performance of the lithium metal electrode in carbonate electrolytes is plagued by unsafe dendrite formation and poor Coulombic efficiency upon cycling. In this presentation, vinylene carbonate, fluoroethylene carbonate and lithium difluoro(oxalate) borate are shown to significantly improve the performance of the lithium metal electrode. Using surface analysis techniques such as Infrared Spectroscopy, X-ray Photoelectron Spectroscopy, and Transmission Electron Microscopy, it is revealed that these electrolyte components modify the Solid Electrolyte Interphase of the lithium metal electrode, leading to the observed improvement in performance.