



DEPARTMENT OF  
**Chemistry**  
UNIVERSITY OF WISCONSIN-MADISON

## *Ph.D. Dissertation Defense*

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Hamers Research Group

Friday, May 3, 12 pm in Chemistry 9341

### *“Stability and Solvation Properties of Organosilicon Electrolytes for Lithium-ion Batteries”*

Lithium-ion batteries are increasingly used for energy storage today due to their excellent energy capacity and voltage characteristics. However, the limited electrochemical and thermal stability of conventional carbonate-based lithium-ion battery electrolytes constrains the development of devices with higher voltages and longer lifetimes. Novel organosilicon solvents and additives for battery electrolytes, developed by Silatronix, Inc. with the University of Wisconsin-Madison, have demonstrated improved oxidative stability, reduced gassing, and increased thermal stability. I will discuss efforts to develop a fundamental understanding of the underlying molecular mechanisms that give rise to reduced thermal and electrochemical degradation in organosilicon-based electrolytes. In addition, I will explore the nature of lithium solvation in mixed carbonate-organosilicon electrolytes to provide insight into the impact of organosilicon solvents as single solvent, co-solvent, and additive components of high-performance lithium-ion battery electrolytes.

