

HIGHLANDS IN CHEMISTRY SEMINAR SERIES



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“Targeting Energy Solutions: From Fundamental to Applied Inorganic Redox Chemistry”

SEPTEMBER 18, 2020

2:30PM

ZOOM

FACULTY HOST:
DIANA IOVAN

This talk will broadly focus on designing and investigating main-group and/or transition-metal based redox-active molecules, targeted for use in fundamentally new bond activation chemistry and energy applications. The first part will focus on the design of redox-active metal complexes bearing redox non-innocent ligands for use in either chemical or electrochemical energy storage applications. Here, the talk will mostly center on the design of new charge carriers for solution and slurry-based redox-flow battery applications for grid-scale energy storage. The second part will focus on our recent work investigating new cooperative main-group/transition metal reactivity involving P(+5)=O centers linked to V redox-active cores. Here, we have uncovered that coupling these partners can enable fundamentally new reactivity at the (typically innocent) P=O fragment mimicking a proposed proton-coupled electron transfer pathway involved in industrial alkane C-H activation chemistry. Lastly, our most recent results on an extension of this P=O chemistry will be presented which feature the applied, electrochemically-driven capture and release of U using cluster carborane chemistry.