

INORGANIC SEMINAR

Tuesday, February 27, 2024

12:30 PM, BRWN 4102

“The Effect of Lewis Acid Adducts on Cyanometallates”



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Abstract: Cyanometallates have a rich history as molecular anions, from being used as polymers, within industrial dyes, and seeing applications in OLEDs and sensors due to their attractive electrochemical properties. Their oxidized forms can be accessed synthetically, further allowing for their use within flow batteries or as photocatalysts. The coordination of a Lewis acid (LA) adduct, such as boranes, boosts their photophysical and electrochemical properties, typically due to stabilization of the metal-based t_{2g} ($d\pi$) orbitals. Boronated cyanometallates display electrochemically reversible redox couples and exhibit comparable or higher electron transfer rate constants than their cyanido precursors. Moreover, boronation allows for the accessibility of low oxidation states, particularly notable for the Mn(I) and Cr(II) complexes. Other effects of boronation are the emergence of new ligand-to-metal charge transfers in paramagnetic cyanometallates, attributed to the C–N π -bonding and B–C σ -bonding interactions. An investigation of boronated cyanometallates with metals ranging from Cr to Fe and Os will be presented, with a comparison of their emergent photophysical properties to their cyanido precursors.



Department of Chemistry

Seminar time will be shared with Rachael Knieser