



UNIVERSITY OF MINNESOTA
Driven to Discover™

Department of Chemistry

Student Seminar Series

9:45 a.m. Tuesday, February 17, 2015 • 331 Smith Hall

Associate Professor

Timothy Jackson

Department of Chemistry
University of Kansas

Insights into Manganese-dependent Enzymes from Biomimetic Peroxo- and Oxomanganese Complexes

Website:

<http://chem.ku.edu/people/faculty/tjackson>

Abstract

Redox-active manganese enzymes participate in vital biological processes, including the defense against free radicals, the oxidation of aromatic substrates, and the conversion of nucleotides to deoxynucleotides. In many cases, these enzymatic reactions are initiated through the activation of dioxygen, or one of its reduced derivatives (superoxide or hydrogen peroxide), by an active-site manganese(II) center. While peroxy- and oxo-manganese species are commonly proposed as intermediates in these processes, the fleeting nature of the enzymatic intermediates prevents a detailed understanding of geometric and electronic contributions to reactivity.

This presentation will describe our ongoing efforts to provide insight into these intermediates by examining the physical properties and reactivity of biomimetic manganese complexes. A particular focus of the talk will be recent kinetic, spectroscopic, and computational investigations aimed at understanding the spectroscopic properties and reactivity of peroxomanganese(III) and oxomanganese(IV) species.

Associate Professor Timothy Jackson has been faculty member in the Department of Chemistry at the University of Kansas since 2007.



He earned a bachelor's degree in chemistry from St. Cloud State University in 2000, and a doctorate in chemistry from the University of Wisconsin-Madison in 2004.

Prior to his appointment at the University of Kansas, he was a National Institutes of Health post-doctoral fellow at the University of Minnesota in Professor Lawrence Que Jr.'s group.

His areas of expertise include reactivity studies of metal ion complexes and enzymes and characterization of unstable transition metals intermediates in biological systems. In particular, his research is aimed at uncovering the reaction pathways of environmentally beneficial manganese complexes of relevance to biological and industrial processes.

Professor Jackson has received numerous awards such as the inorganic chemistry research award in 2004, a National Science Foundation CAREER award in 2011, the University of Kansas Chancellor's Silver Anniversary Teaching Award in 2012, and an Outstanding Freshman Seminar Award in 2013.

Host:
Alireza Shokri