

# INORGANIC CHEMISTRY SEMINAR

## Synthetic Cluster Models of Biological and Heterogeneous Catalysts for O<sub>2</sub> Production



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**Wednesday, November 20, 2013**  
**Cram Conference Room, 3440 Mol Sci**  
**4:30 pm**

Refreshments will be served

### Abstract

Redox-inactive metals are found in biological and heterogeneous water oxidation catalysts, but their roles are currently not well understood. Targeting synthetic model clusters of these catalysts, triphenylbenzene moieties appended with pyridine and alkoxide donors were utilized as multinucleating ligands for first-row transition metals. Complexes of Mn<sup>2+</sup>, Fe<sup>2+</sup>, Co<sup>2+</sup>, Ni<sup>2+</sup>, Cu<sup>2+</sup>, Zn<sup>2+</sup> were synthesized and found to display trinuclear cores supported by bridging alkoxides. Trimanganese complexes were used as precursors for more elaborate metal oxide clusters. Tetranuclear complexes displaying Mn<sub>4</sub>, Mn<sub>3</sub>Ca and other Mn<sub>3</sub>M motifs (M=Na<sup>+</sup>, Sr<sup>2+</sup>, Zn<sup>2+</sup>, Sc<sup>3+</sup>, Y<sup>3+</sup>) with varied number of bridging oxo ligands were prepared and studied. A significant variation of reduction potentials on the nature of the redox inactive metal was observed. Implications to the function of the oxygen evolving complex of photosystem II and synthetic oxygen production catalysts will be discussed.

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