Dependence of [Fe$^{II}$(L$_x$)]-NO binding on Aminocarboxylate Ligand structure: Changes in both non-chelating and chelating atoms.

Ryan Hutcheson

Chelate complexes of Fe$^{II}$ have been studied over the years for their ability to behave as both oxidants and antioxidants of dioxygen, as well as potential catalysts for the reduction of nitric oxide to dinitrogen. However, the first systematic study of the ligand-metal-substrate has only been done recently by Schenppensieper et al.$^1$. Interestingly, they found a direct correlation of nitric oxide binding and dioxygen binding (very low selectivity for either) and were able to correlate ligand-metal structure and ligand size to reversible/irreversible binding of nitric oxide. They were also able to correlate this to the kinetics of oxidation by dioxygen shown by the faster oxidation by dioxygen corresponding to tighter and more irreversible binding of nitric oxide to the metal. Further analysis and explanation into the structure and the analysis of the d-d and LMCT transitions in relation to these values will be done based on UV-VIS and ATR-IR spectra collected.

References: