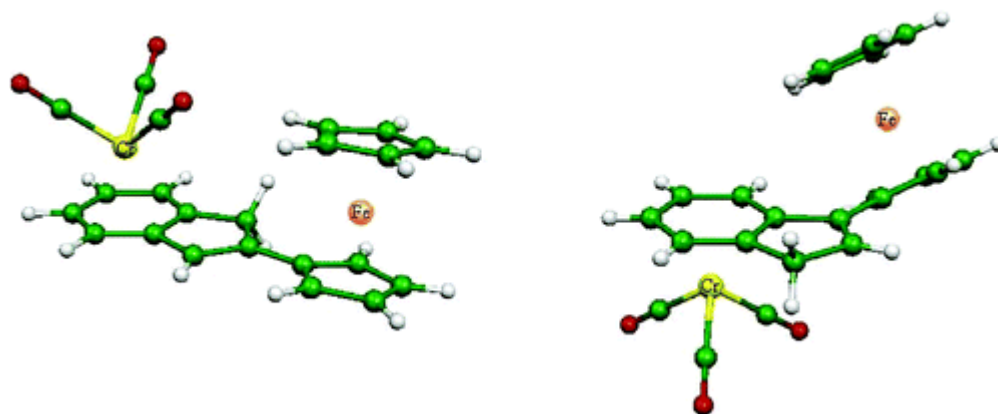


Professor Santi's research group focuses on electronic coupling between metal centers in multinuclear metal complexes. Metal ions linked by aromatic ligands often have unique physical, optical, and redox properties due to electronic communication through the ligands. Electrochemical and spectroscopic methods are used as complementary ways of investigating metal-metal coupling. Charge-transfer bands in the IR have been used to identify which geometric isomers of a chromium-tricarbonyl-indenyl-ferrocene complex exhibit stronger intervalency between metal sites, while cyclic voltammetry is used to probe for alterations in redox potential due to coupling.



Two isomers of a bimetallic complex investigated by the Santi group. Image from reference 1.

Similar indenyl-rhodium-ferrocene complexes have also been investigated. Varying ancillary ligands has been found to tune metal-metal valence correlation. In a similar complex lacking a second metal center, stereochemistry and methylation of the indenyl ligand is found to modulate the energy of ligand-to-metal charge transfer bands, which has implications for understanding ligand roles in analogous bimetallic complexes. The Santi group regularly uses X-ray diffraction to determine geometry of crystallized complexes and DFT modeling of molecular orbitals to rationalize observed results.

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- 1) [Organometallics](#), **2005**, *24* (19), pp 4691–4694. DOI: 10.1021/om050307c
 - 2) [Chem. Eur. J.](#), **2007**, *13* (7), pp. 1955-1968. DOI: 10.1002/chem.200600724
 - 3) [Organometallics](#), **2007**, *26* (24), pp 5867–5879. DOI: 10.1021/om700673m