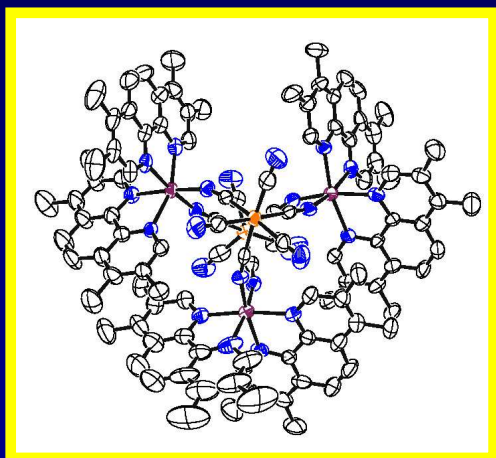


Trigonal Bipyramid Clusters with Remarkably Broad Range of Physical Properties

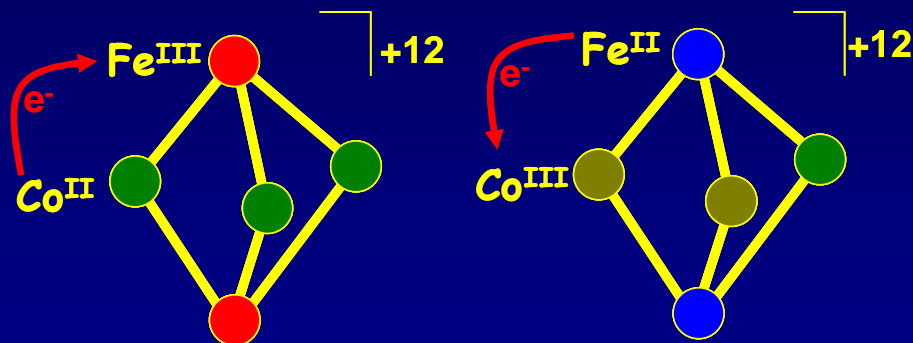
Catalina Achim, Department of Chemistry, Carnegie Mellon University

The current quest for increased capacity of information storage devices has fuelled intense research of molecule-based materials that can be bistable. Our research is focused on the investigation of molecules that can undergo spin transitions between two different spin states and contain multiple Fe(II) ions. In these complexes, the spin transition can be affected by intramolecular interactions between the metal ions.

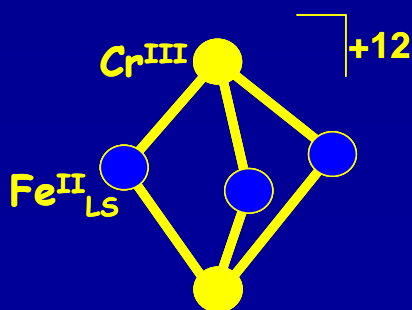
The study of trigonal bipyramid clusters that contain five transition metal ions bridged by cyanide ions revealed several novel magnetic and charge transfer properties identified in the figures below.



Charge Transfer Coupled Spin Transition in Fe-Co Clusters



Ferromagnetic Coupling of Cr^{III} $S = 3/2$ Mediated by $\text{NC-Fe}^{\text{II}}_{\text{LS}}\text{-CN}$ Bridges in Cr-Fe Clusters



Fe^{II} $\text{LS} \leftrightarrow \text{HS}$ Spin Transition in Fe-Fe and Co-Fe Clusters

