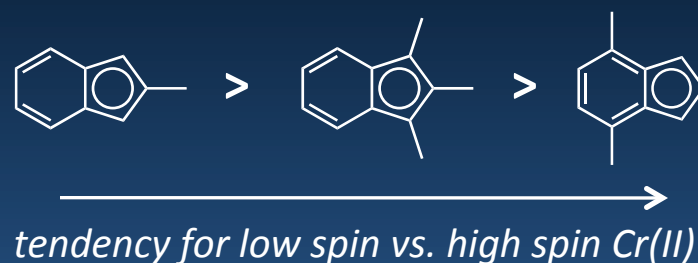


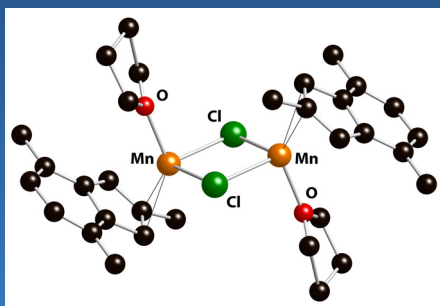
Tunable Control of Magnetic Properties in Transition Metal Indenyl Complexes

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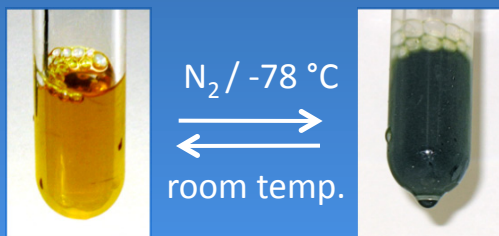
Substitution on the ligands in bis(indenyl) complexes can influence their magnetic spin states, and methyl groups on the 'backside' benzo ring are surprisingly *more* effective in stabilizing a low-spin ground state than those on the ring that is bonded directly to the metal. DFT calculations link these effects to particular symmetry features of the indenyl π orbitals.



Manganese(II) indenyl complexes—the undiscovered frontier



One goal of this research is to incorporate spin-crossover compounds into new classes of magnetically active materials. A step toward this has been taken in the isolation of new manganese(II) indenyl complexes with unanticipated interactions between ligand substitution, spin state, and chemical reactivity.



The yellow $(2,4,7\text{-Me}_3\text{C}_9\text{H}_4)\text{MnCl}(\text{thf})$ complex is a conventional-looking dimer in the solid state (above left), but when cooled below room temperature reacts with N_2 and H_2 to form deeply colored adducts. In contrast, the related bis(indenyl) complex $(2,4,7\text{-Me}_3\text{C}_9\text{H}_4)_2\text{Mn}$, despite a spectacular octomeric structure (at right), does not react with N_2 . The reasons for these differences are under study.

