New Directions in Iron-Cyanide Chemistry

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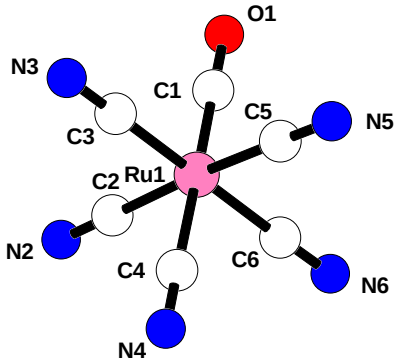
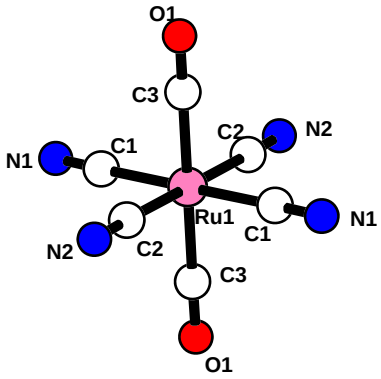
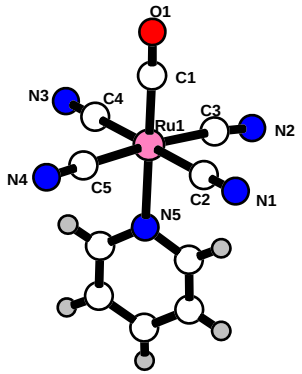
Iron$(CN)_x(CO)_y$ centers are present at the active sites of the two major class of hydrogenase enzymes. As an extension of investigations on fundamental Iron cyanide chemistry, ruthenium and osmium cyanide compounds have been synthesized and characterized. As was the case for iron, $[Ru(CN)_xL_y]^n$ and $[Os(CN)_xL_y]$n complexes where L are monodentate ligands and x is less than five were virtually unknown. New compounds include $[Ru^{II}(CN)_5(CO)]^{3-}$, $[Ru^{II}(CN)_4(CO)_2]^{2-}$ and $[Ru^{II}(CN)_4(pyridine)(CO)]^{2-.}$ A key goal is the development of systems that mimic the reactivity of the hydrogenase enzymes.



$[Ru^{II}(CN)_5(CO)]^{3-}$



trans-$[Ru^{II}(CN)_4(CO)_2]^{2-}$



trans-$[Ru^{II}(CN)_4(CO)(py)]^{2-}$