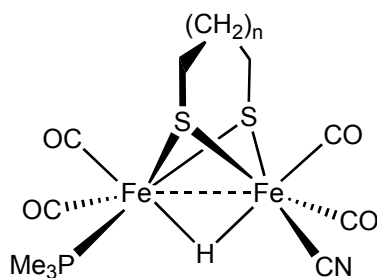


Ferrous Thiolato Carbonyls and Their Connection to the Fe-only Hydrogenases

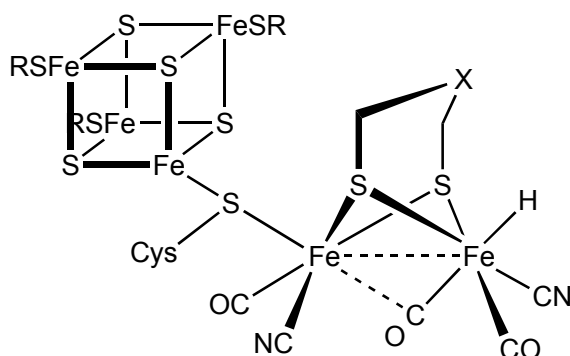
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The Fe-only hydrogenases are highly efficient catalysts for hydrogen evolution and oxidation. The unusual structure of the active site of these enzymes, together with the technological implications of their reactivity, has attracted intense interest from both biological and chemical scientists. Of the four known states of the active site, diamagnetic H_{red} and $S = 1/2$ H_{ox} are catalytically active. Our early studies identified $HFe_2(S_2C_3H_6)(CN)(CO)_4(PMe_3)$ as an efficient biomimetic catalyst. The lecture will survey recent progress and remaining challenges focusing on functionality, structure, and cofactors. Of particular interest is the elucidation of the redox and substitutional behavior of low-spin diferrous dithiolates, especially systems of the type $Fe^{II}_2(S_2C_nH_{2n})(\mu-CO)(CN)_2L_{4-x}(CO)_x$.



functional model
 $Fe^{II}-Fe^{II}$



H_{red}
 Fe^I-Fe^I or $Fe^{II}-Fe^{II}$