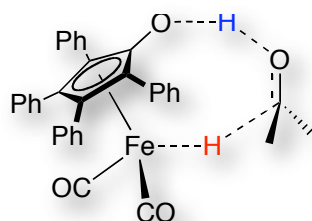
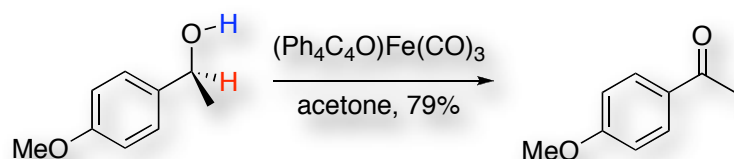


Bifunctional Catalysts for C—H Bond Conversion

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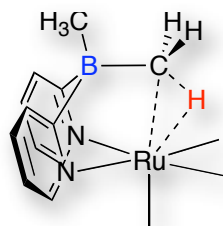


Bifunctional catalysts offer excellent potential for designing *reactivity* and *selectivity* into two separate parts of a molecular scaffold. For example, one could design a bifunctional catalyst in which one combines a C-H bond activation system with a coordinating group that can direct the catalyst to particular C-H bonds.

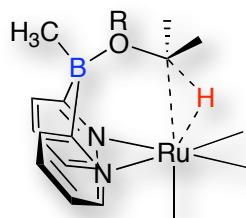


We have recently applied this concept to the development of an **iron(0)-based oxidation catalyst** that exploits a **proton** to direct **hydride** abstraction from alcohols.

We are currently developing a two-metal **boron-ruthenium system** to enable us to extend this concept to general C-H groups. In this model the boron will coordinate a lone pair in the C-H activation target and the ruthenium will affect hydride abstraction from a neighboring C-H group. Oxidation by this mechanism has homology to a C-H agostic complex that we have recently characterized. We are currently working with a hydroxide-bridged bimetallic complex that is convenient pre-catalyst for C-H oxidation reactions.



An agostic boron methyl



Hydride abstraction from an ether

