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## Role of Lewis Acids in a Multifunctional Approach to CO Hydrogenation

Synthesis gas (CO and H<sub>2</sub>) is readily available from methane, coal, or biomass, but its utility as an intermediate for the production of fuels and chemicals is limited by poor selectivity. New multifunctional, dual-catalyst strategies for the selective conversion of synthesis gas to C<sub>2+</sub> organic products are presented. Our approach relies on the incorporation of pendent Lewis acidic groups in the secondary coordination sphere of a metal carbonyl complex: pendent trialkylboranes promote facile C–H and C–C bond formation. Structure-function studies reveal that the reductive coupling chemistry is highly sensitive to the specific structure of the pendent borane. This chemistry can be extended to utilize dihydrogen *directly* as a reductant, by a “frustrated Lewis pair” (FLP) mechanism, realizing a selective CO hydrogenation and coupling reaction to form a metal-bound C<sub>2</sub> organic fragment.

## SPECIAL SEMINAR

WED., DEC. 8<sup>TH</sup>

AT 3:30 P.M. IN SEMINAR HALL