CORE-CM SEMINAR
Michigan State University

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Addition of HX to Transition Metal Amide Bonds: Catalysts for Nitrile Hydration and the Water Aldehyde Shift Reaction

We have been interested in the use of transition metal complexes as catalysts for the decomposition of formic acid and other low molecular weight carboxylic acids into gaseous products such as CO_2 and H_2 for their potential use as low temperature chemical gas generators. In particular, we have demonstrated that the unusual Mn(I) complex, $[R_2P(CH_2)_2N(CH_2)_2PR_2]Mn(CO)_2$ is a catalyst for the decomposition of formic acid in this manner. In this talk, the addition of HX bonds to this compound to give $[R_2P(CH_2)_2N(H)(CH_2)_2PR_2]MnX(CO)_2$ will be discussed. The hydroxide complex, where X = OH, has particularly interesting reactivity since it catalyzes the aldehyde-water shift reaction, making benzoate from benzaldehyde and water. A related ruthenium complex also activates water in a similar fashion and has been shown to be an effective catalyst for the hydration of nitriles to amides.

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