

LAC L. M. Venanzi
Distinguished Lecture 2022 /
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2. Vortrag:

Mittwoch, 11. Mai 2022, 13.00 Uhr, ETH, HCI J3

«The Activation of Small Molecules by Frustrated Lewis
Pairs: A Transition Metal-Free Approach to Formidable Che-
mical Problems»

The demonstration that combination of main group species could activate dihydrogen prompted studies of such systems with a wide variety of other small molecules. In this lecture, again, we will begin with early studies that demonstrated the ability of FLPs to capture such species as CO_2 , CO , SO_2 , N_2O olefins and alkynes, among others. Subsequent efforts probed stoichiometric reactivity while in some cases studies were extended to catalytic processes. Such advances will be discussed for three systems. Efforts to apply FLP chemistry to N_2 reduction will be presented. Related chemistry of CO has also been developed where varying the FLP, stoichiometric chemistry afforded a facile route to isocyanides. In addition, FLPs are shown to mediate the oligomerization of CO while “syn-gas” afforded reactivity modeling key steps in Fischer-Tropsch reactivity. In the case of CO_2 , stoichiometric reactions were shown to provide routes to CO or MeOH , while a catalytic reduction was developed affording selective metal-free routes to methyl iodide or methane. The general potential for future developments is briefly considered.