Palladium(I) and Nickel(I) Bridging Allyl Dimers for the Catalytic Functionalization of Carbon Dioxide

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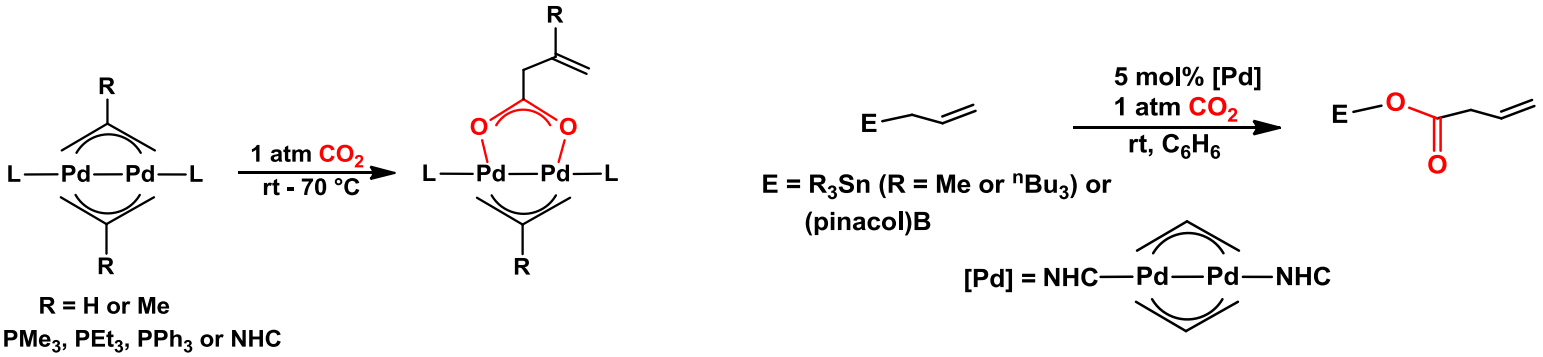
In recent years there has been significant interest in the catalytic functionalization of CO_2 due to the potential of this non-toxic gas as a readily available and inexpensive source of carbon in the synthesis of both commodity chemicals and complex organic molecules. We have demonstrated that unusual Pd(I) dimers with bridging allyl ligands react with CO_2 and can act as catalysts for the carboxylation of allylstannanes and allylboranes at mild conditions.



As part of our studies we have elucidated the mechanism by which Pd(I) dimers with bridging allyl ligands react with CO_2. Recently, we have prepared the family of complexes shown below, which includes complexes with bridging cyclopentadienyl and indenyl ligands. We are currently starting to probe the reactivity of these species with CO_2 and believe that this work may lead to the development of even more active catalysts.