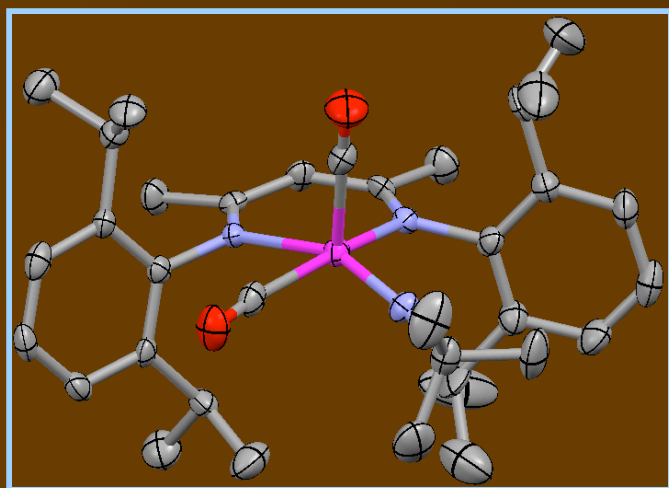
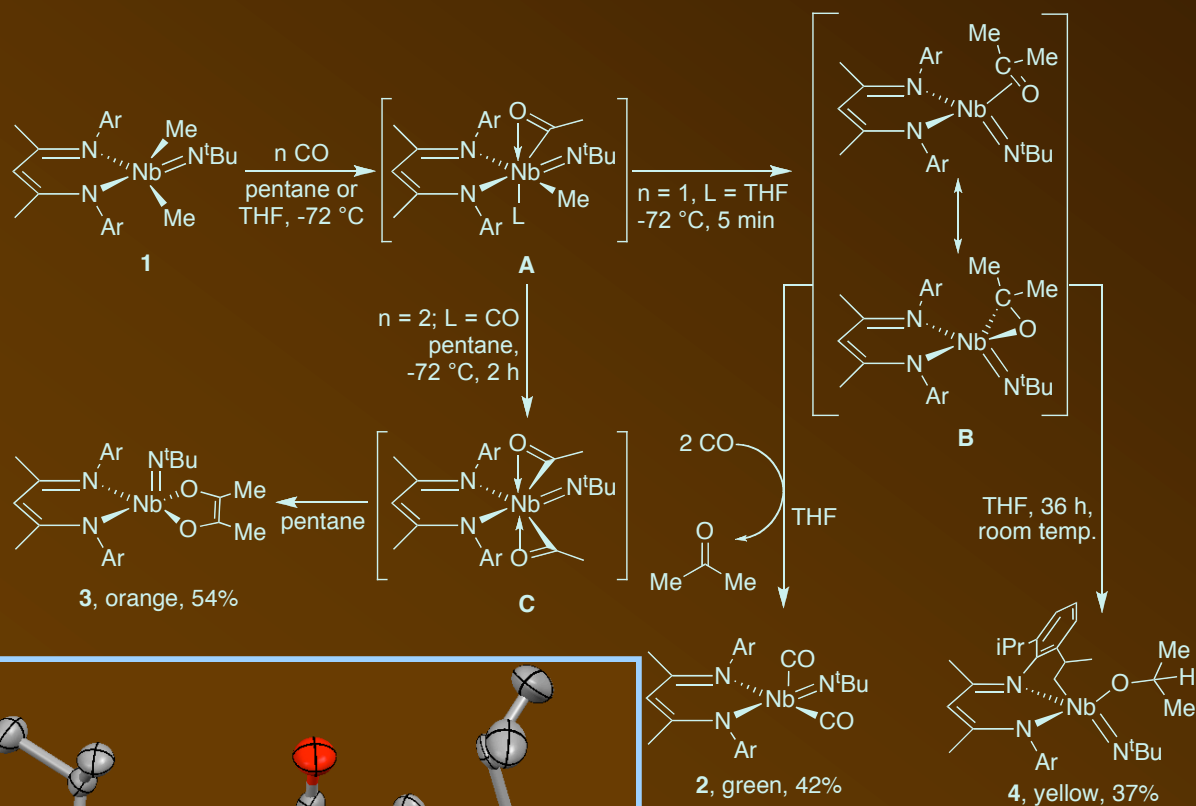


# Fundamental Chemistry of New Group 5 Metal Imido and Bis-Imido Complexes: Carbonylation Reactions on a Dialkylniobium Complex

John Arnold and Robert G. Bergman, University of California, Berkeley, CA 94720



Carbonylation chemistry can be used to introduce a  $\text{C}_1$  fragment into more complex carbon containing species. Typically, carbonylation reactions yield simple mixtures of products. Our example yields an array of products based on reaction conditions. This study has allowed us to identify key intermediates (**A**, **B**, **C**), pointing to a mechanism by which coordination effects direct the product distribution.

Targeted synthesis of species related to the key intermediates have led to the following information in support of the proposed mechanism:

- 1) Both the monoacyl complex **A** and an analogous monoacyl species have been observed by  $^1\text{H}$  NMR spectroscopy
- 2) The reaction of **1** with an isocyanide yields a stable complex that is analogous in structure and reactivity to intermediate **B**
- 3) Performing the reaction in 2,5- $\text{Me}_2\text{THF}$  gives product distributions consistent with solvent coordination control