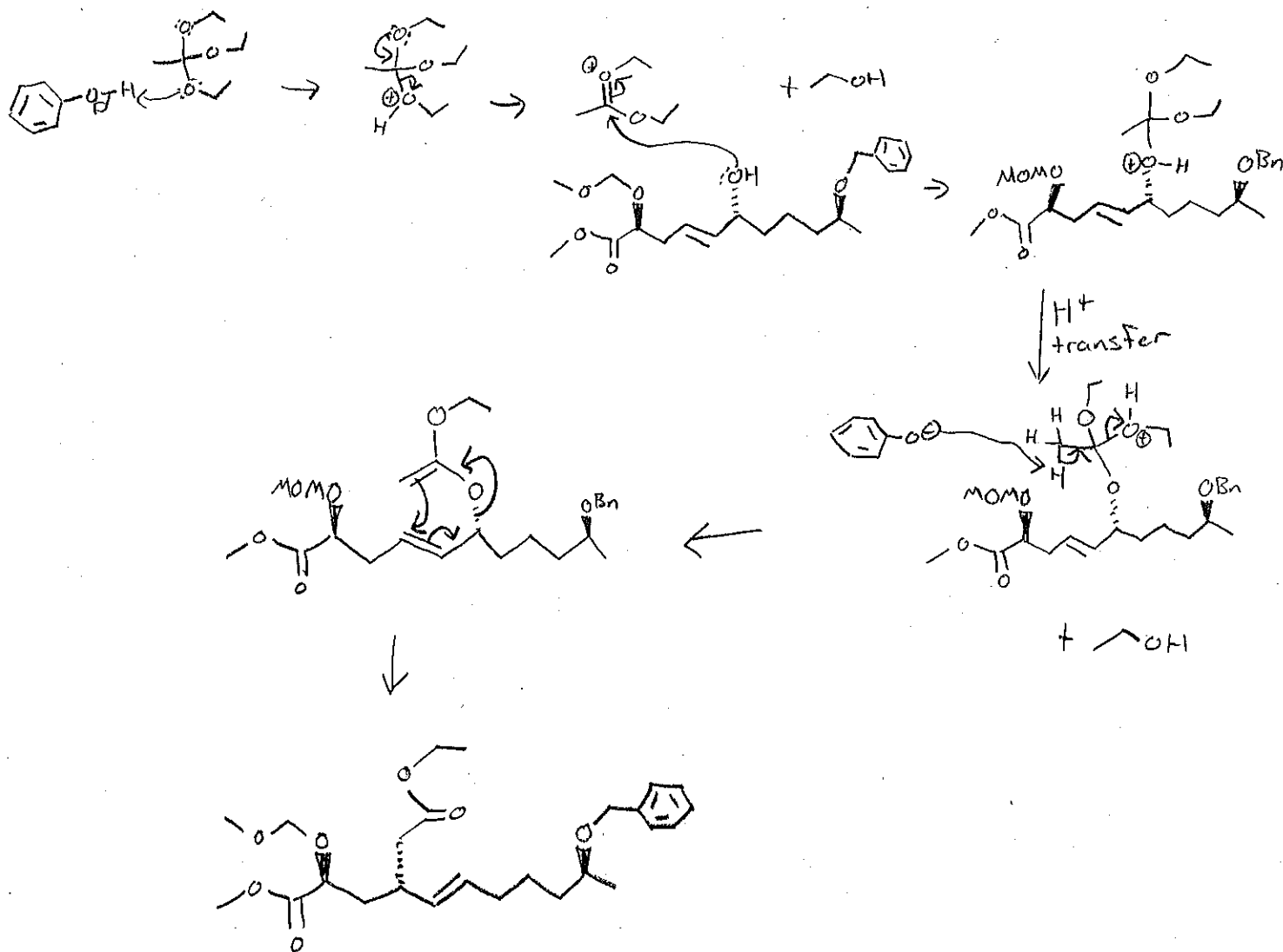
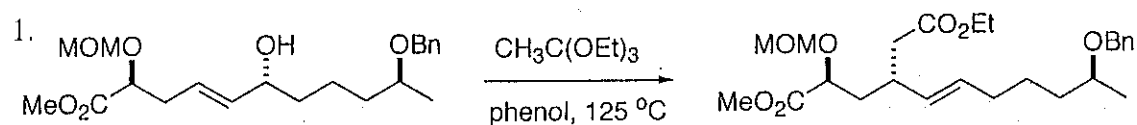


Chem 667-51
March 21, 2006

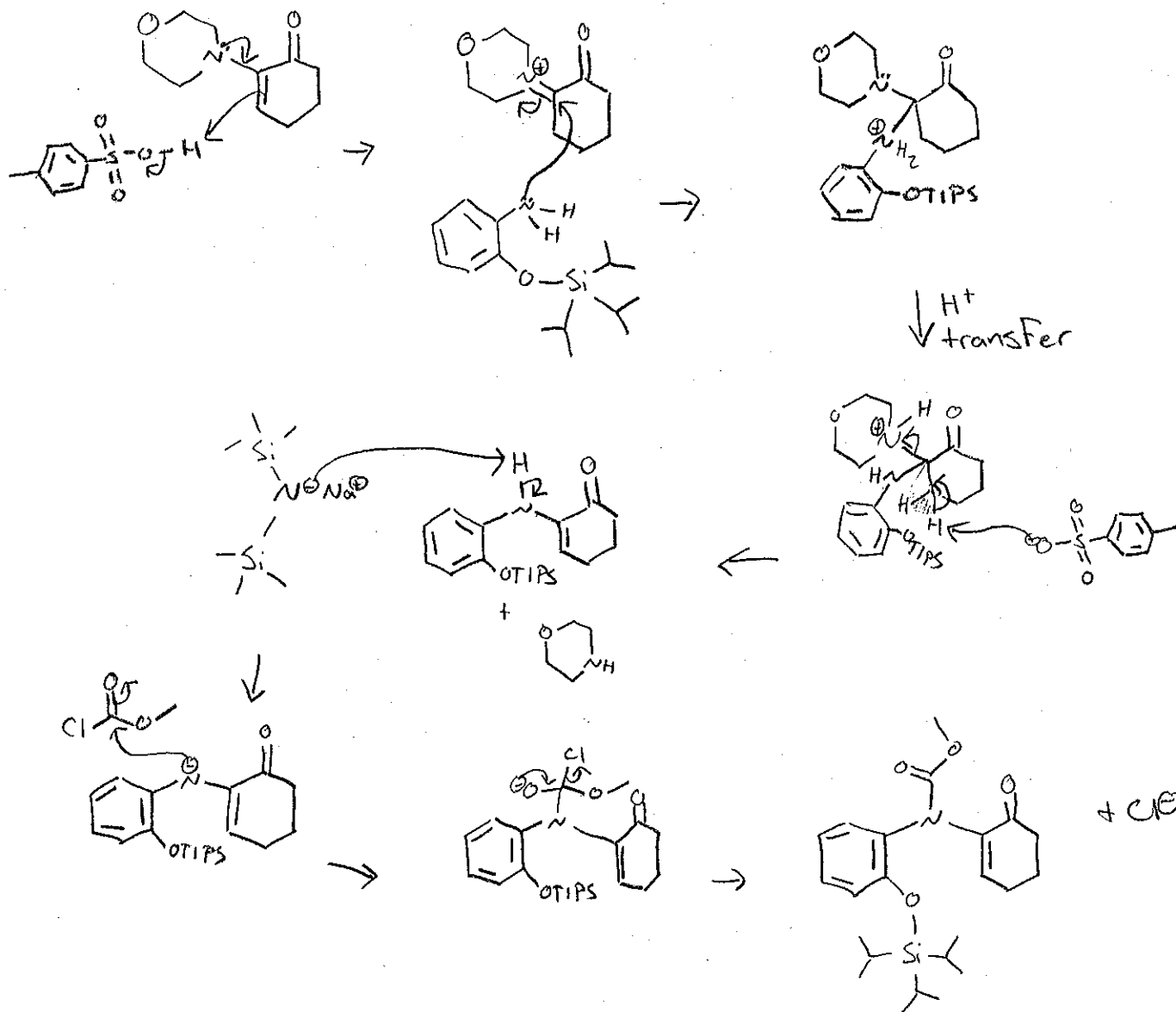
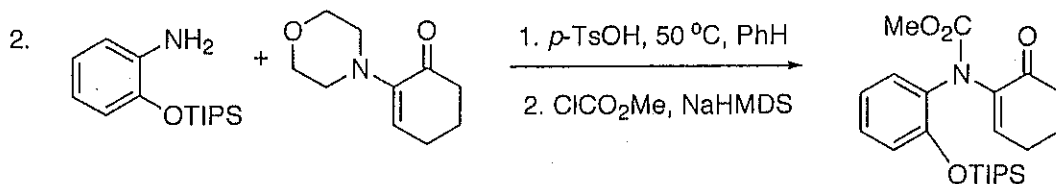
Exam #1 *key*

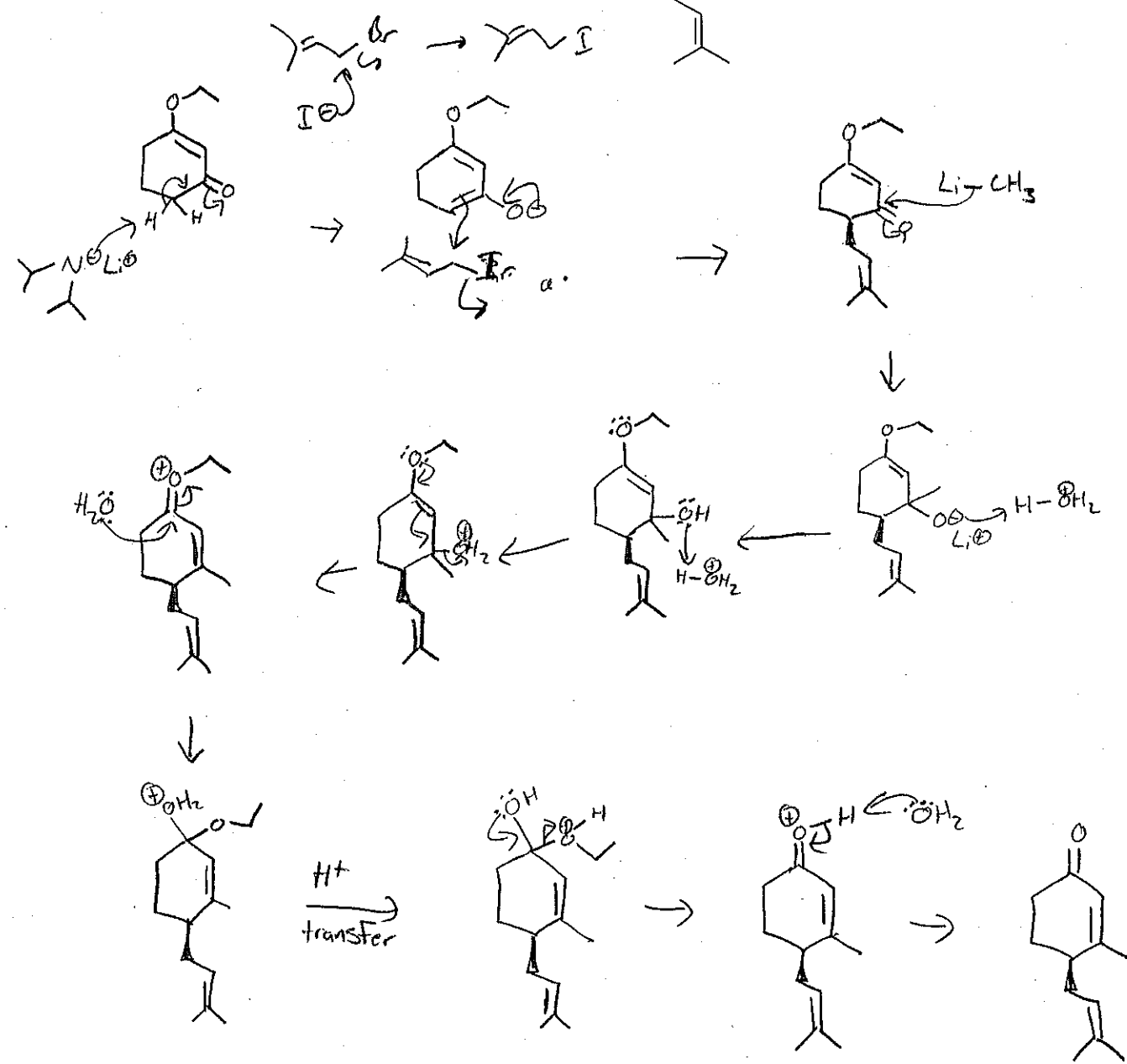
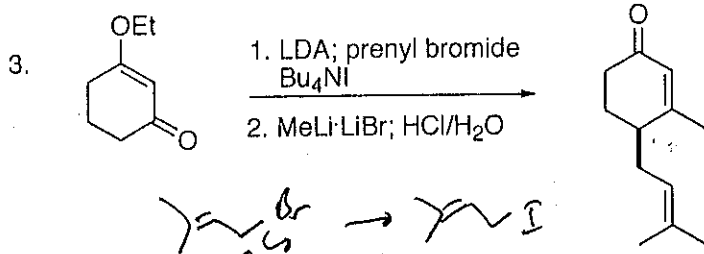
This is an open-book, open notes exam. You may take up to three hours. For each transformation shown, draw detailed arrow-pushing mechanisms for each step, including the explicit chemical structure of every reactant and reagent (show every heavy atom - H's not required), all stereochemistry, and all the organic products of each reaction. The abbreviations are exactly as they appear in the publication.

Each problem is worth twenty points.

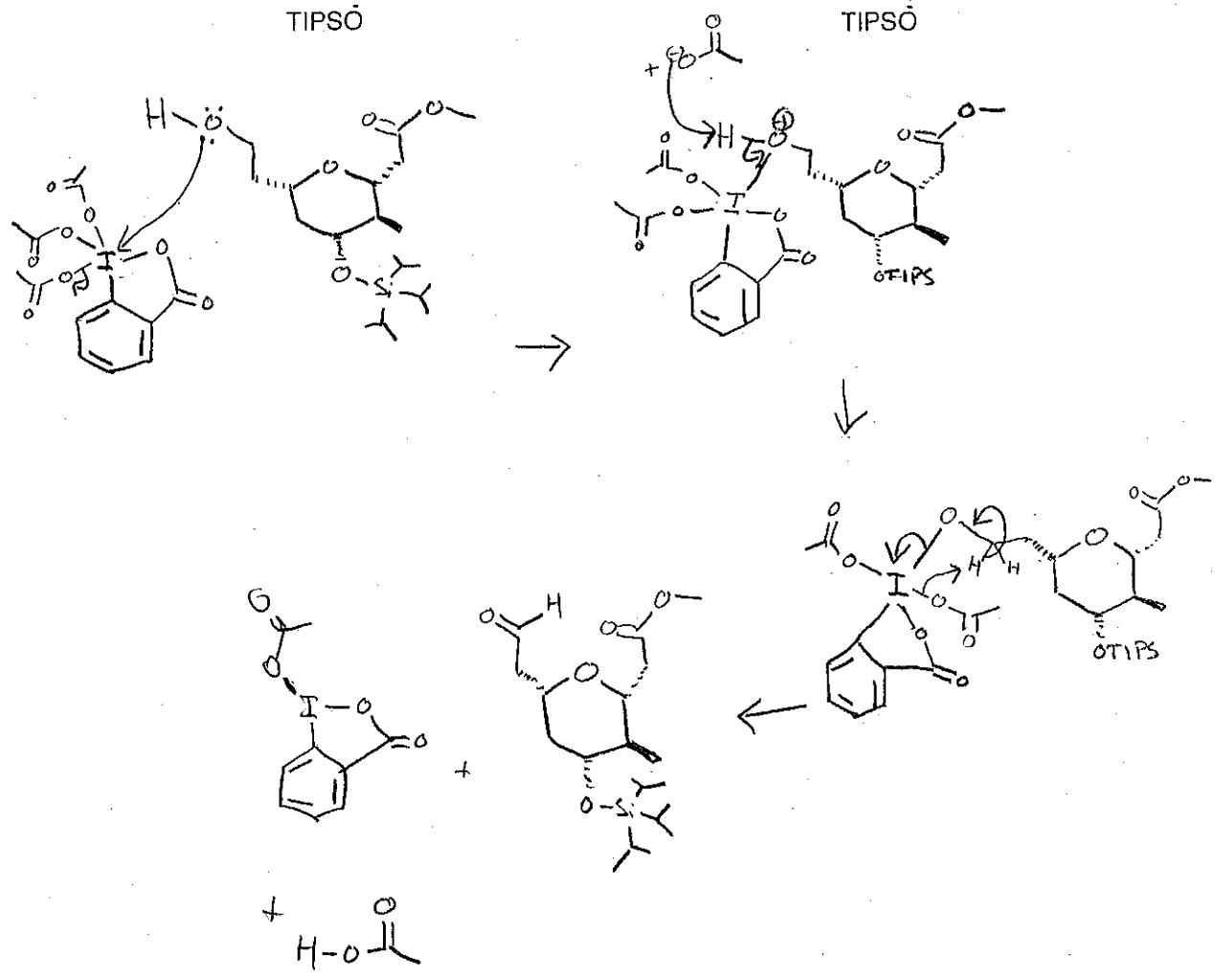
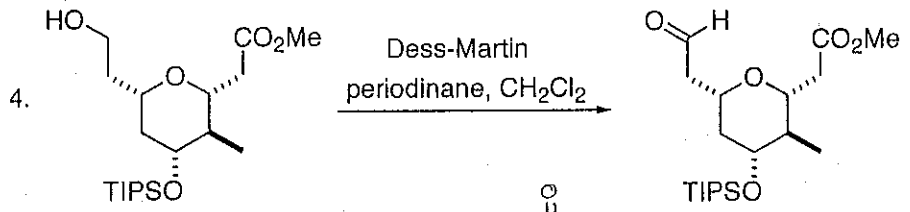


Andrew DeAngelis

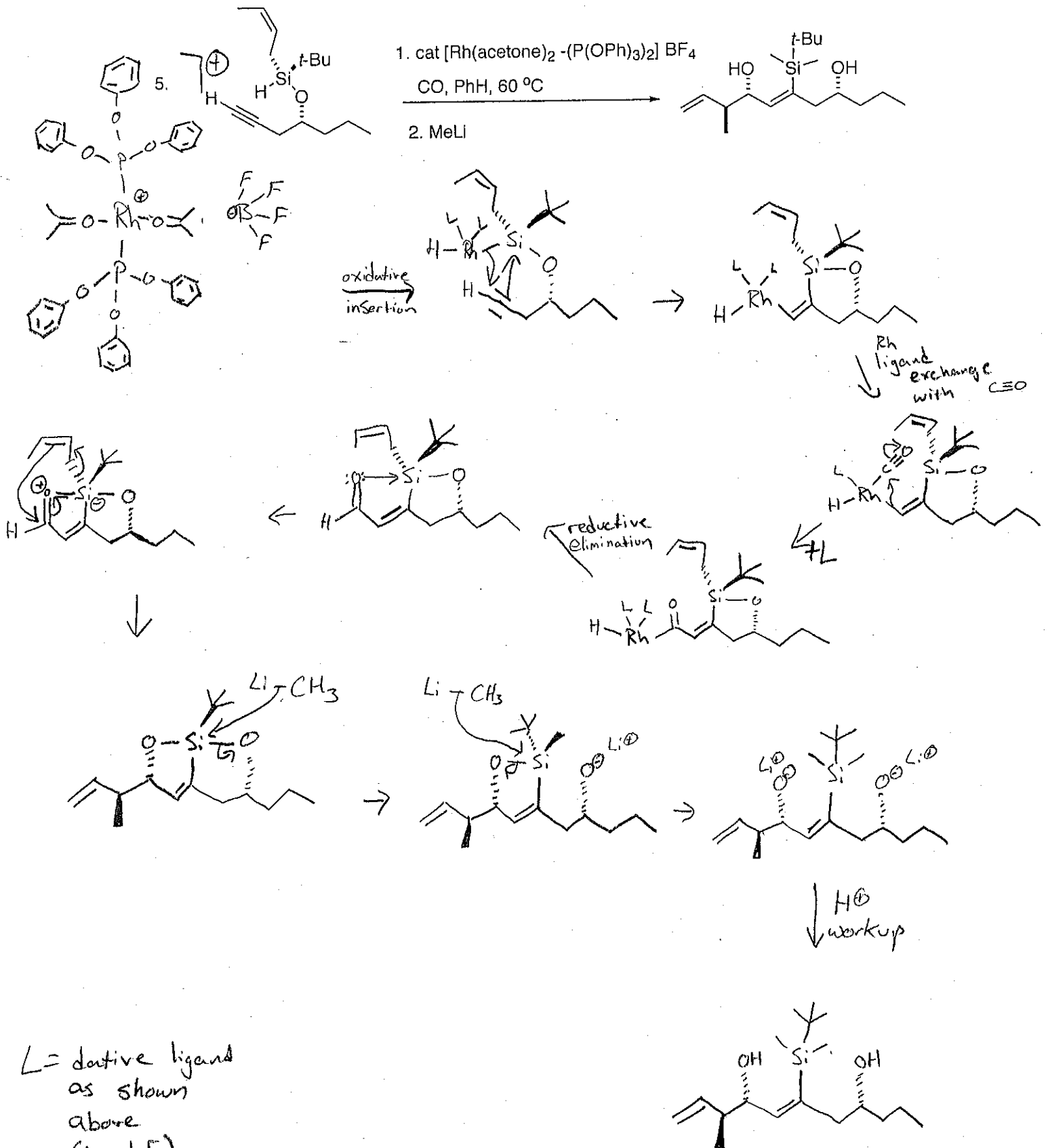




Andrew DeAngelis



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L = dative ligand as shown above (top left)