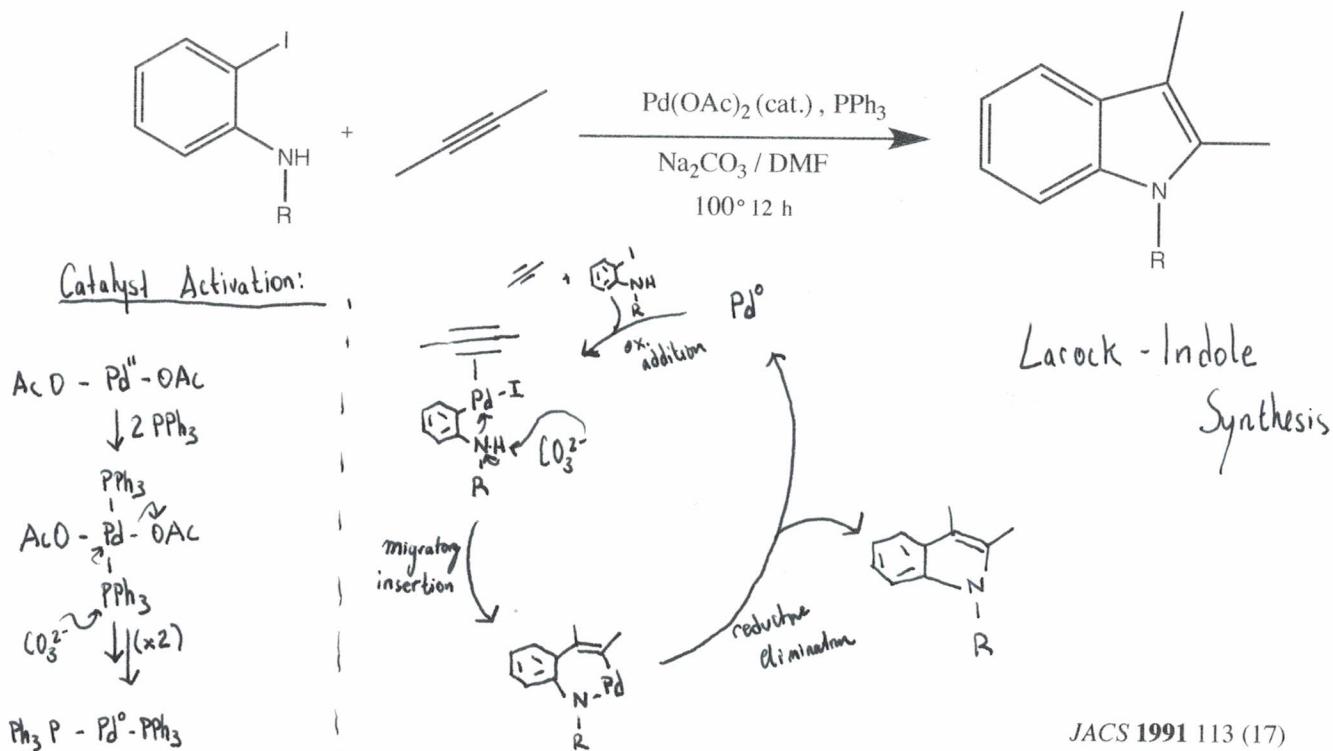
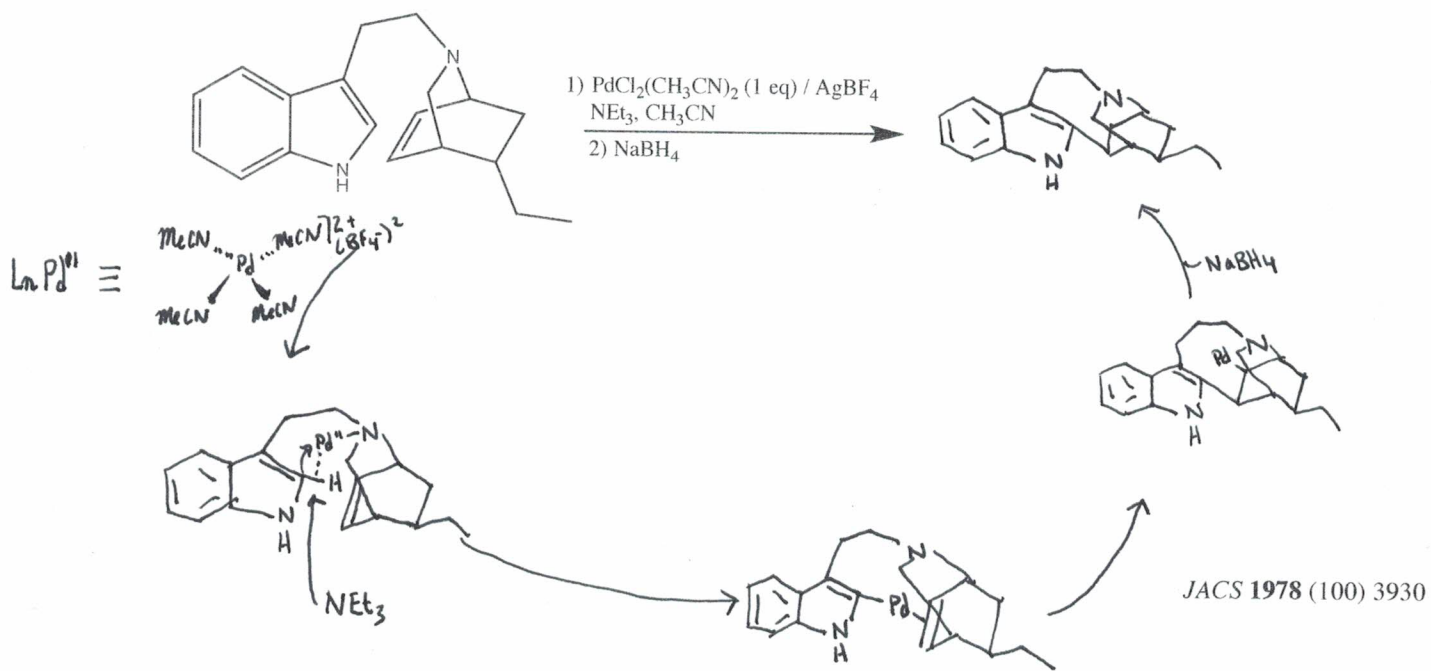


1. Provide the Name Reaction and the mechanism for the following transformation, including the formation of the active catalyst:

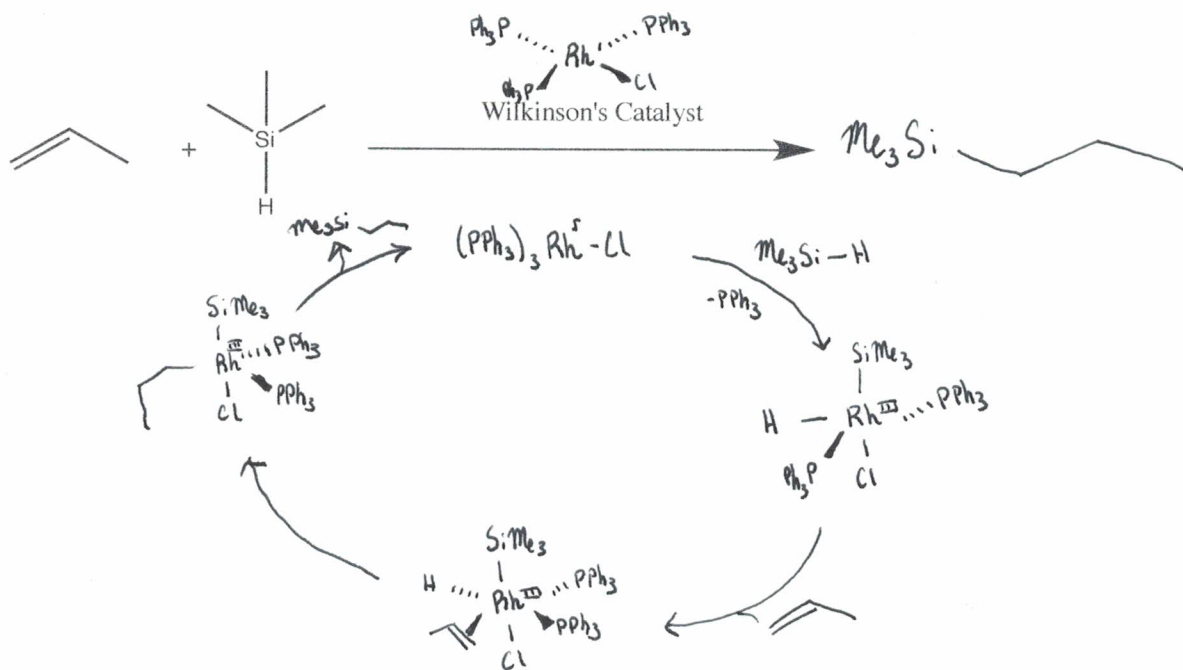
(Hint: The active catalyst is  $Pd^0$ )



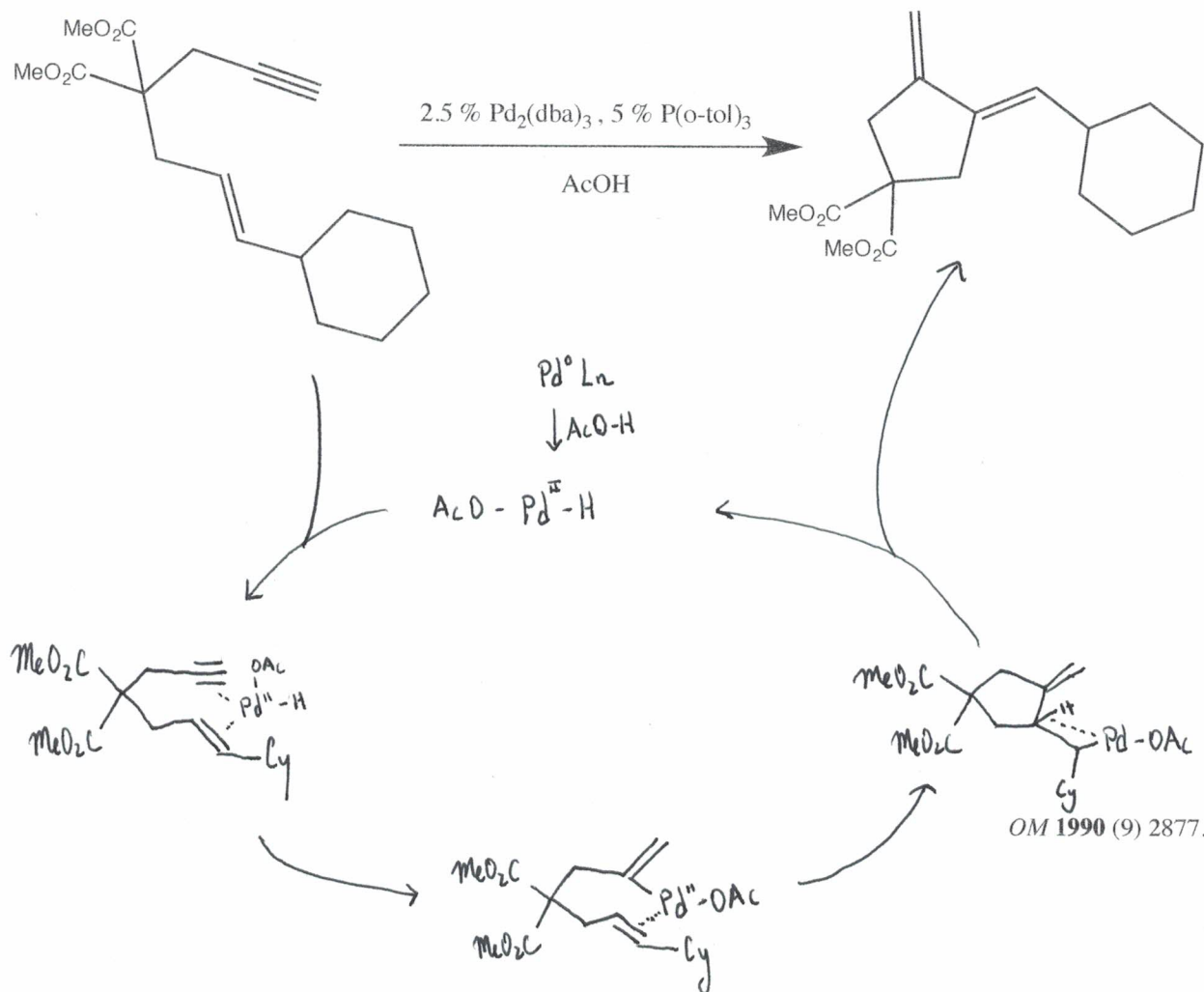
2. Provide the product for the following reaction along with a detailed mechanism.



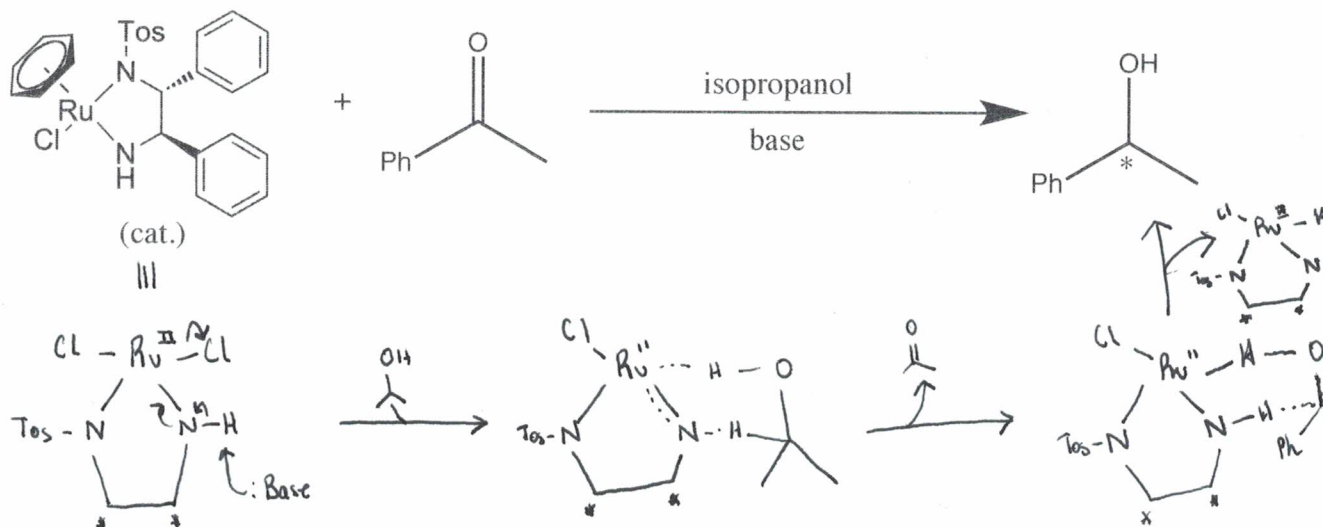
3. Provide the structure of the catalyst, the reaction mechanism, and the major product.



4. Provide a plausible mechanism for the following reaction (you may skip activation of the catalyst):

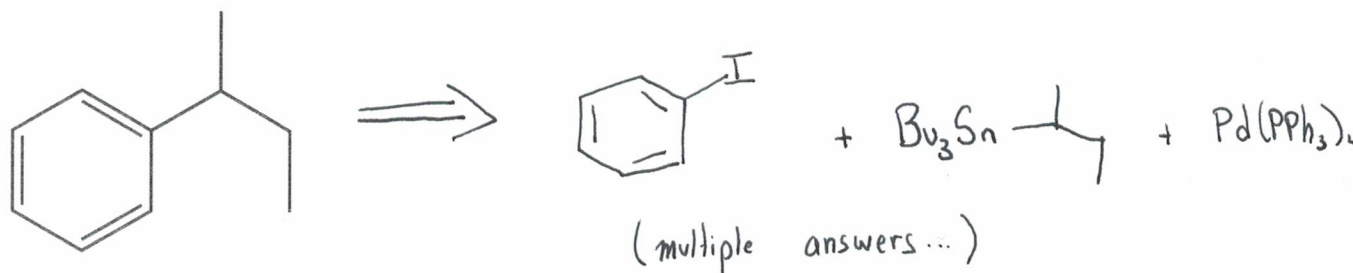


5. Provide the Name Reaction and a plausible reaction mechanism for the following reaction:



JOC 2001 (66) 7931.

6. Provide a retrosynthesis for the compound below from commercially available starting materials (preferably using one organometallic process), and provide the mechanism for the key step.



7. Provide a plausible mechanism for the following reaction:

