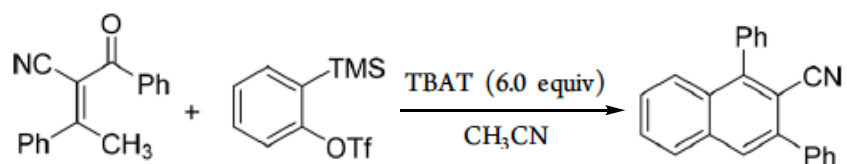


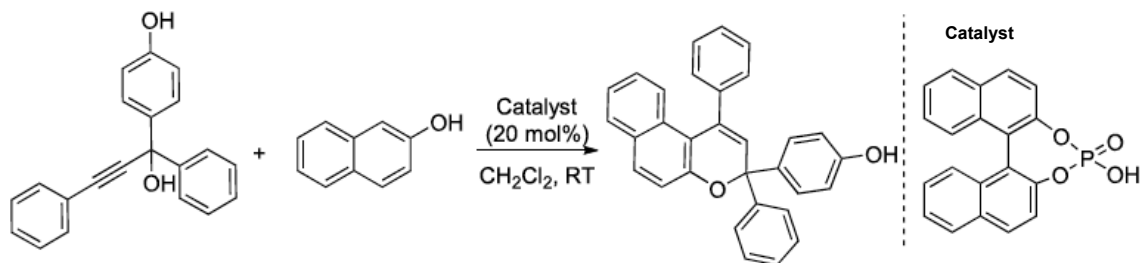
Organic Cumulative Exam (November 5, 2020)

Daesung Lee

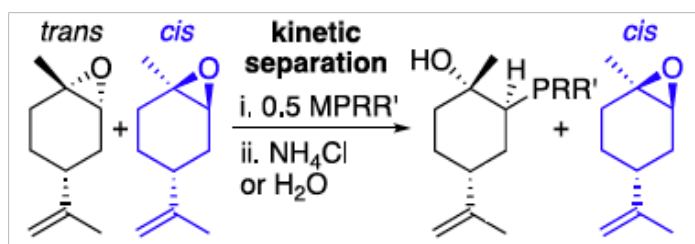
1. (20 Points) Aryne-based annulation is a powerful tool to synthesize functionalized arenes. Consider the structure of the substrates and the reaction conditions, provide a reasonable mechanism of the following transformation.



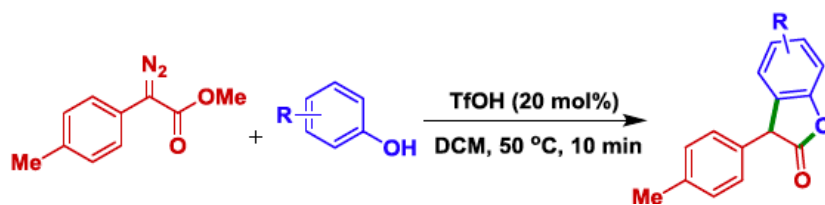
2. (20 Points) On the basis of the catalytic action of the given phosphoric acid as a proton source, provide a reasonable mechanism for following transformation.



3. (20 Points) Conformation of cyclic structures is one of the most important factors for the reactivity and selectivity. Considering the conformation of trans- and cis-limonene oxide shown below, explain why trans-isomer selectively reacts over the cis-isomer under the given conditions.



4. (20 Points) Considering the electronic character of diazo compound, provide an arrow-pushing mechanism for the following reaction.



4. (20 Points) Considering the structure of the substrate and the provided reagents, predict the product of the following reaction.

