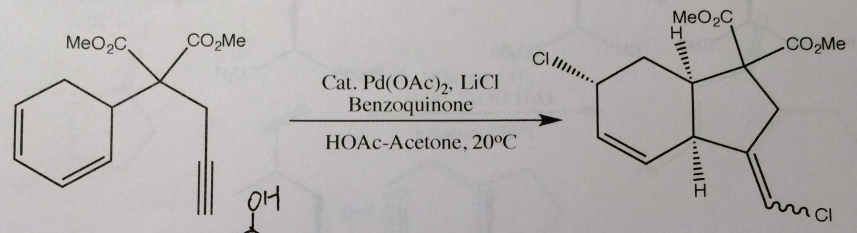
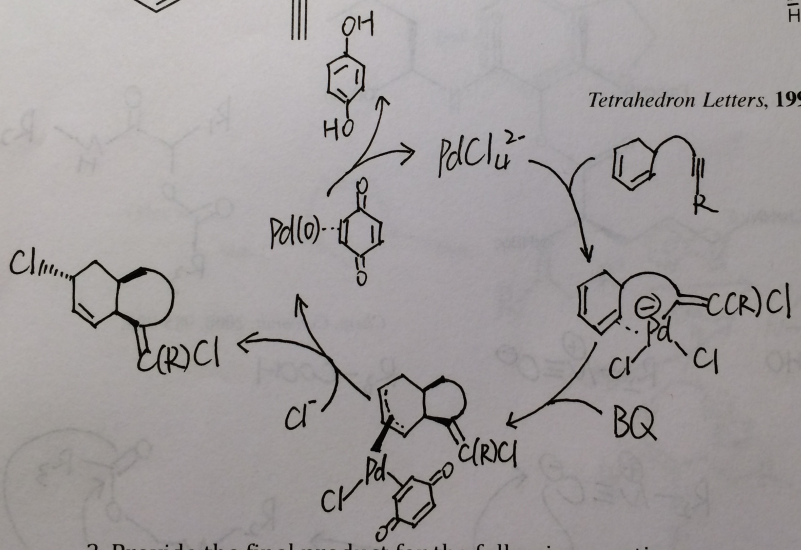
1. Provide the mechanism for the following transformation:

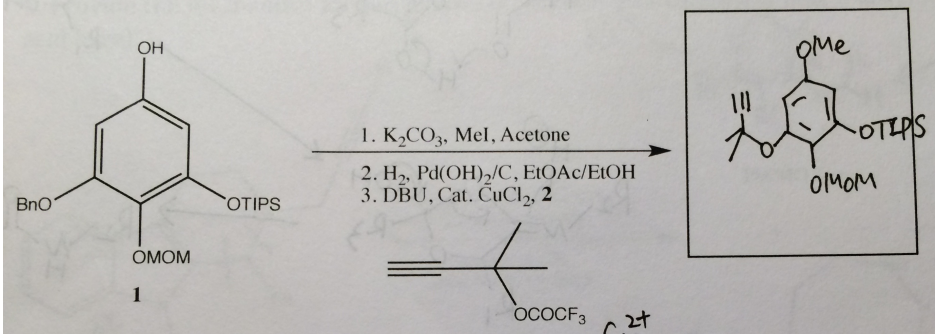


Tetrahedron Letters, **1994**, *35*, 5713-5716.



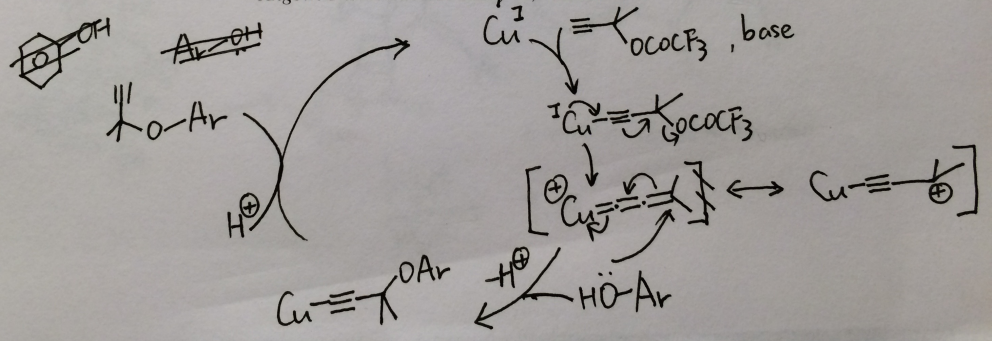
2. Provide the final product for the following reactions.

2. Provide the final product for the following reactions.

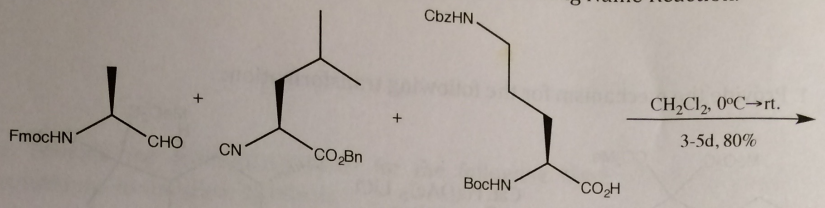


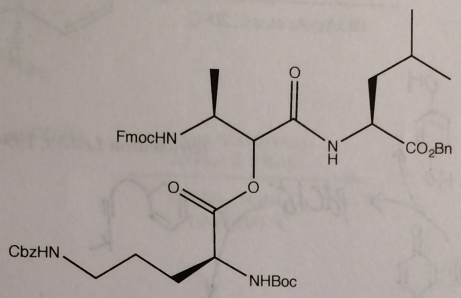
Angew. Chem. Int. Ed. **2003**, *42*, 4225-4229.

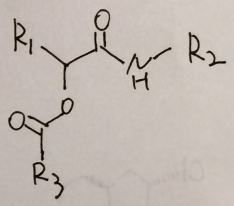
3.



3. Provide the name and the mechanism for the following Name Reaction.



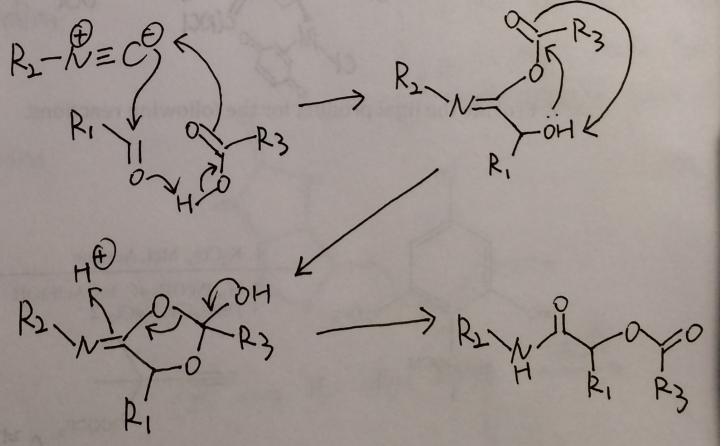




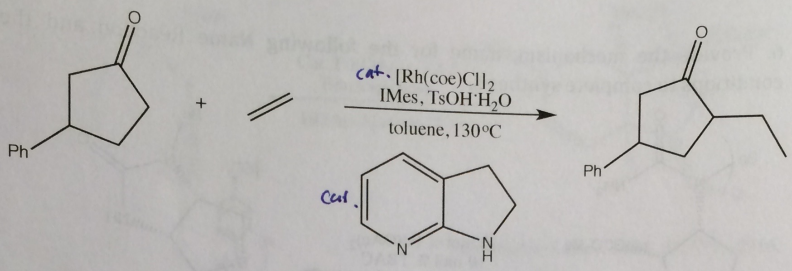
Chem. Commun. **2000**, 985-986.

R_1-CHO $R_2-\overset{\oplus}{N}\equiv C^{\ominus}$ R_3-COOH

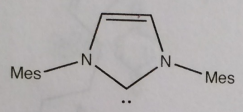
Passerini Reaction



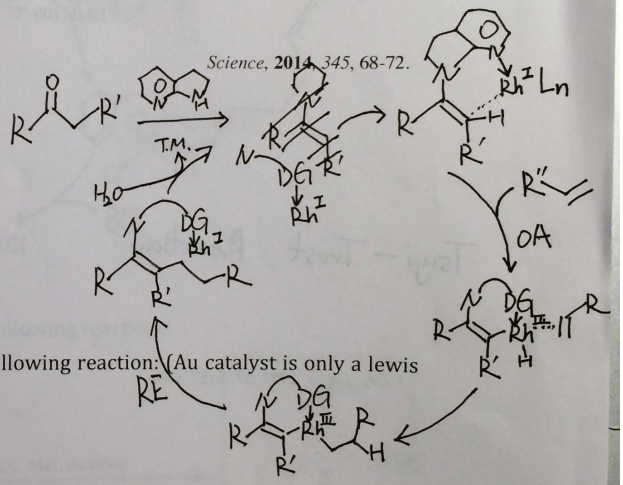
4. This is a recent work of Guangbin Dong. Propose a suitable mechanism for this transformation:



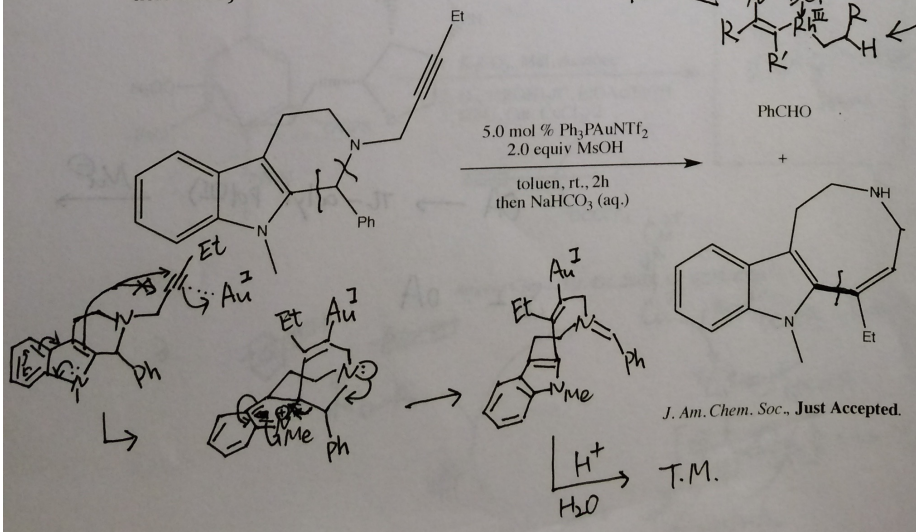
IMes =



Science, **2014**, *345*, 68-72.

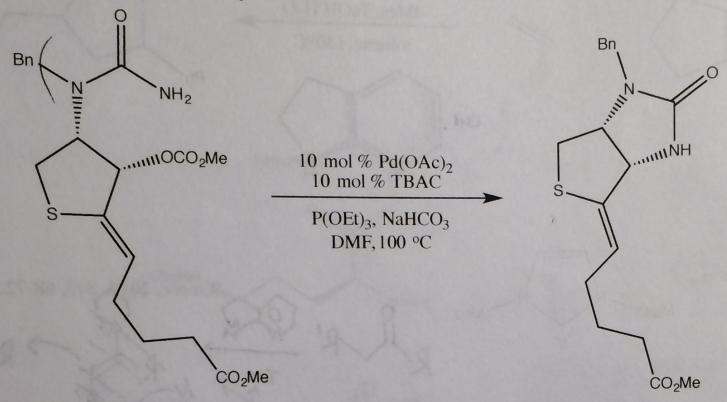


5. Provide the mechanism for the following reaction: (Au catalyst is only a lewis acid here)



J. Am. Chem. Soc., **Just Accepted.**

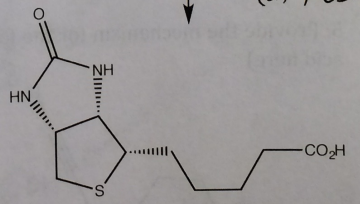
6. Provide the mechanism, name for the following Name Reaction and the conditions to complete synthesis.



Tsuji – Trost Reaction.

1). H_2, $Pd(OH)_2/C$, AcOEt
2). (i) NaOH, MeOH, H_2O
(ii) $MeSO_3H$, xylene

J. Org. Chem. **2002**, *67*, 5527-5536.



OA → π-allyl Pd(II) $\xrightarrow{Nu^{\ominus}}$

S_N2 OA