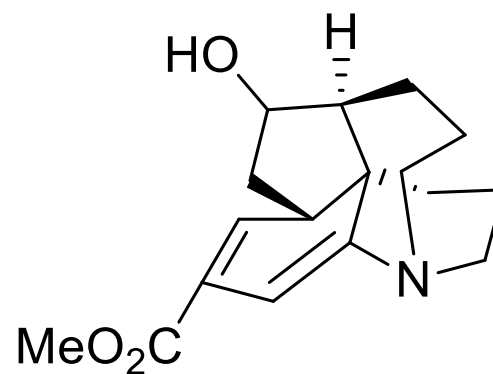
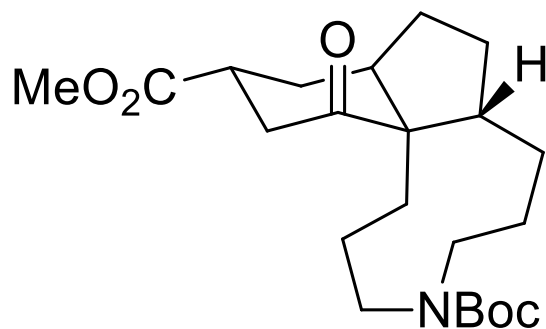


Total Synthesis of (-)-Huperzine Q (+)-Lycopladine B and C



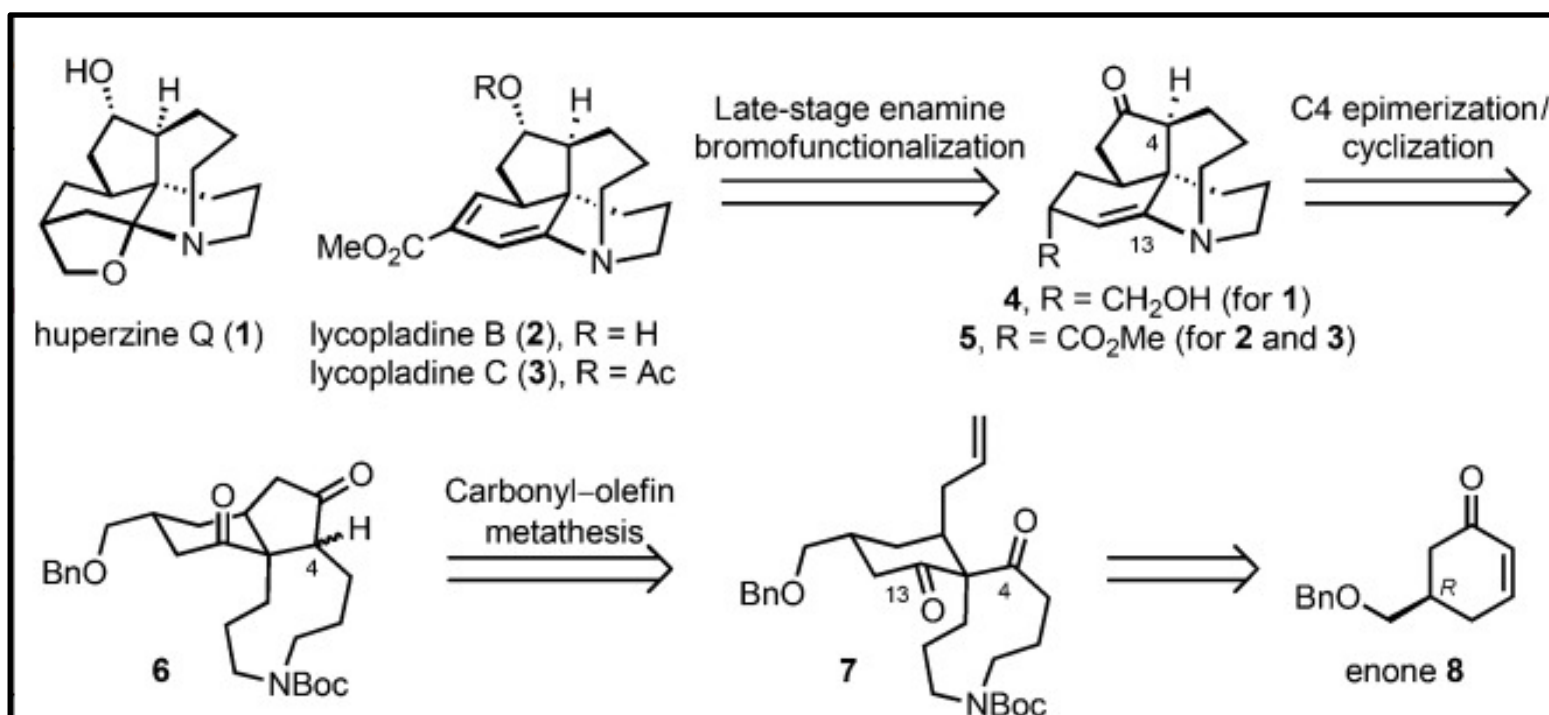
Niloofar Safaie
CEM 852

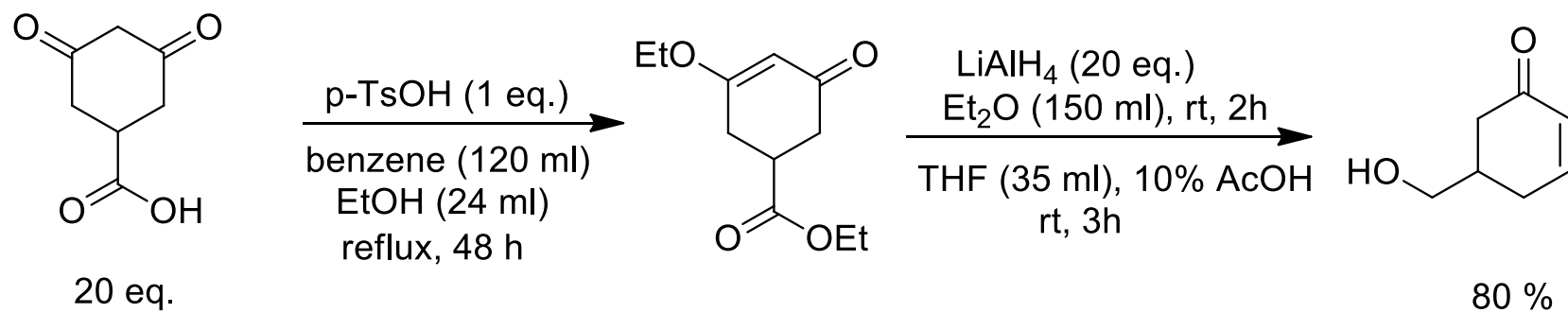
Angew. Chem. Int. Ed. **2015**, 54, 1011-1015.

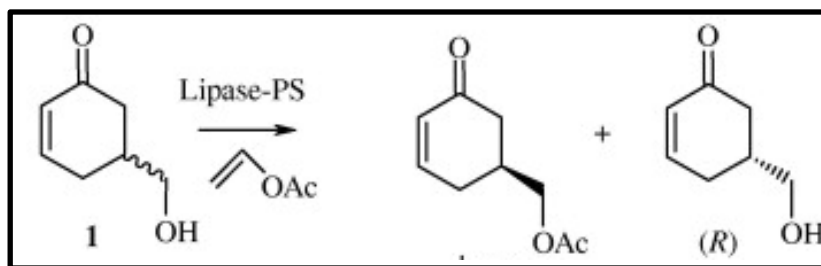
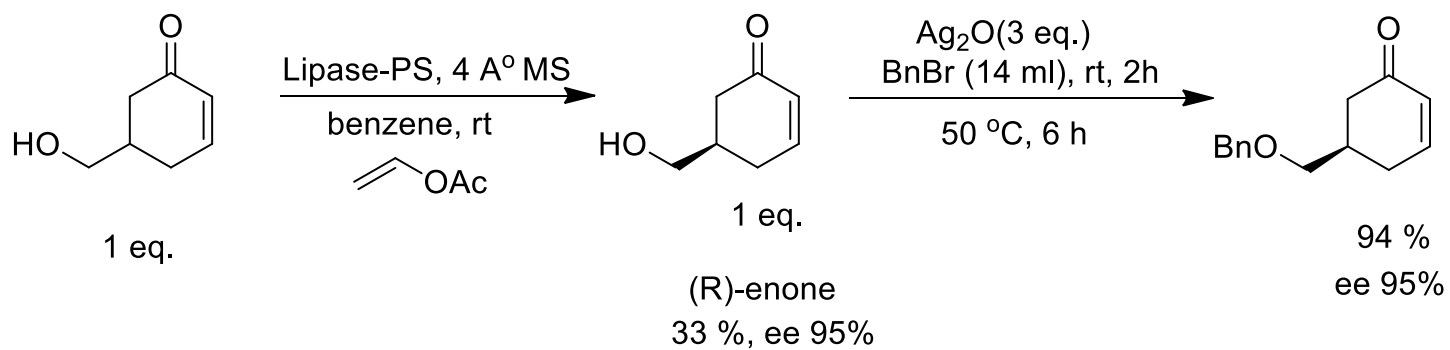
Background

- Huperzine Q isolated by Zhu in 2002 and has unique aminal moiety and six stereogenic centers.
- It was synthesized by Takayama in 19-steps.
- Lycoplamine isolated by Kobayashi in 2006, however, no synthetic method has been reported.

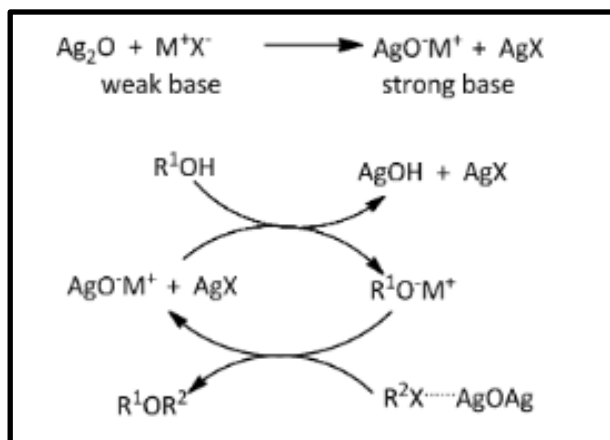
Retrosynthesis

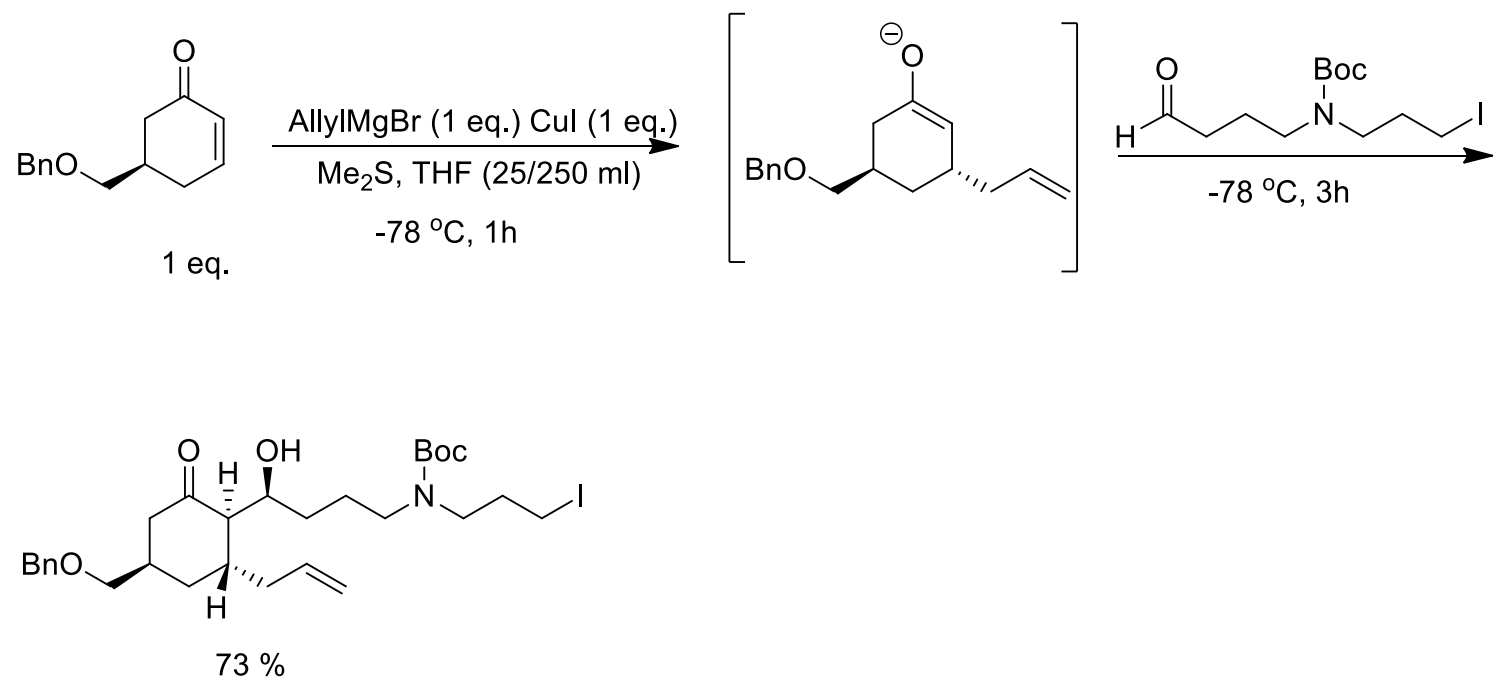


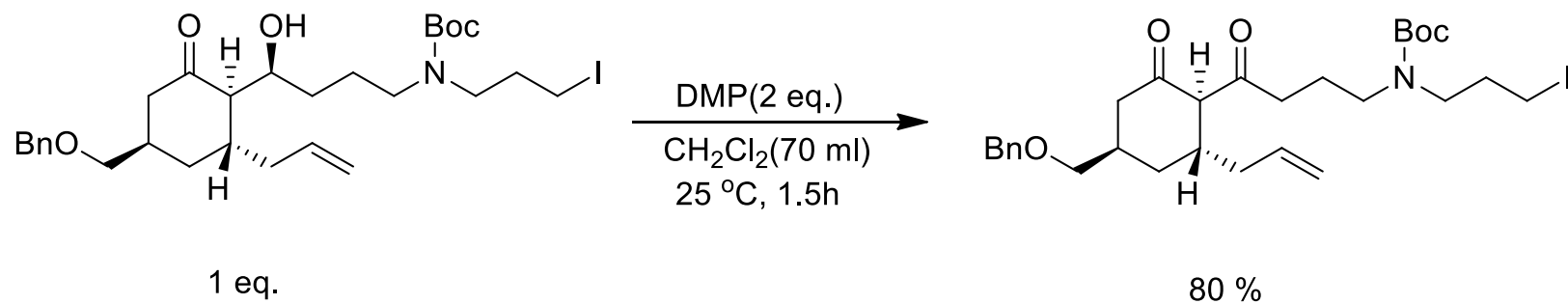




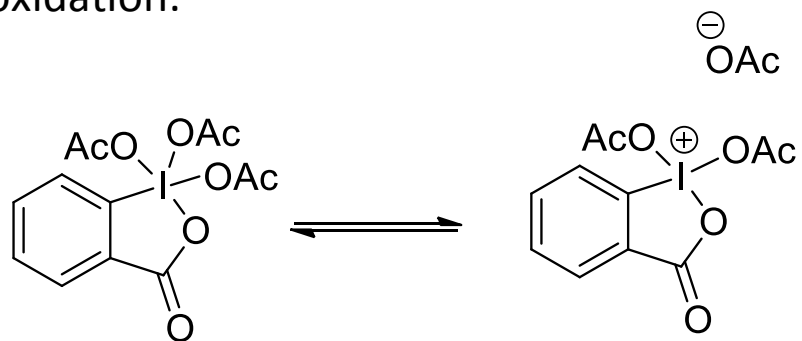
Silver oxide increases basicity:

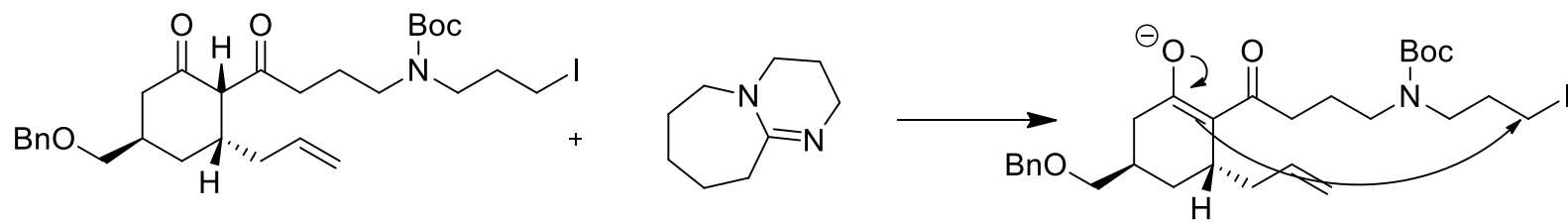
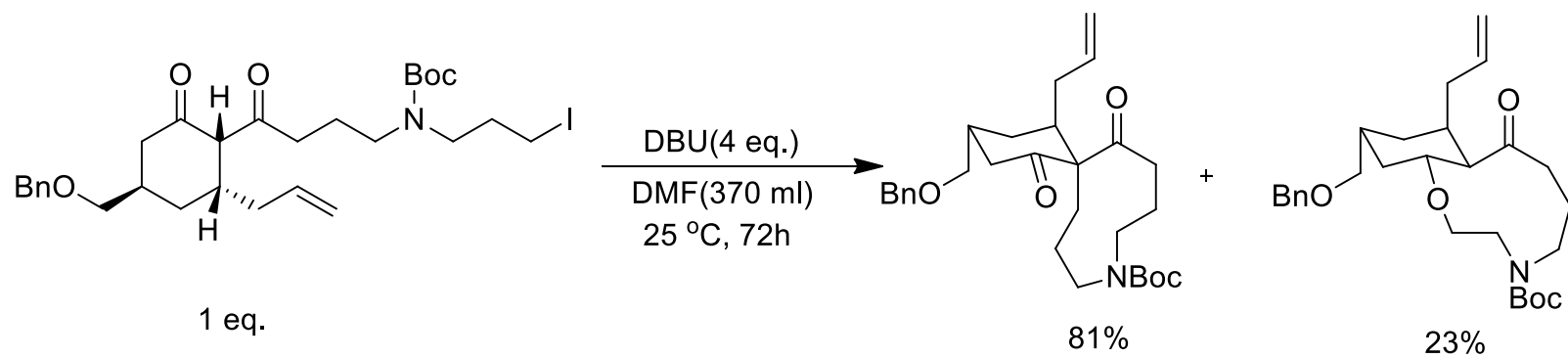


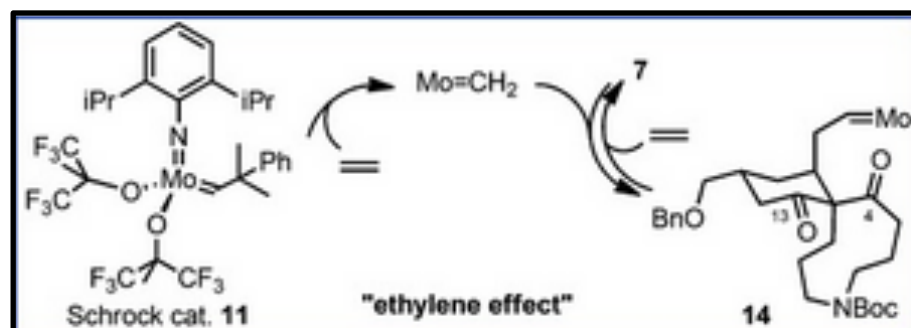
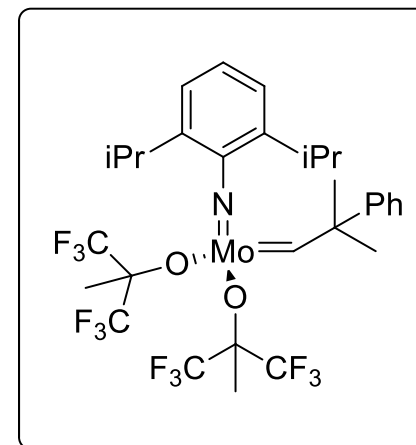
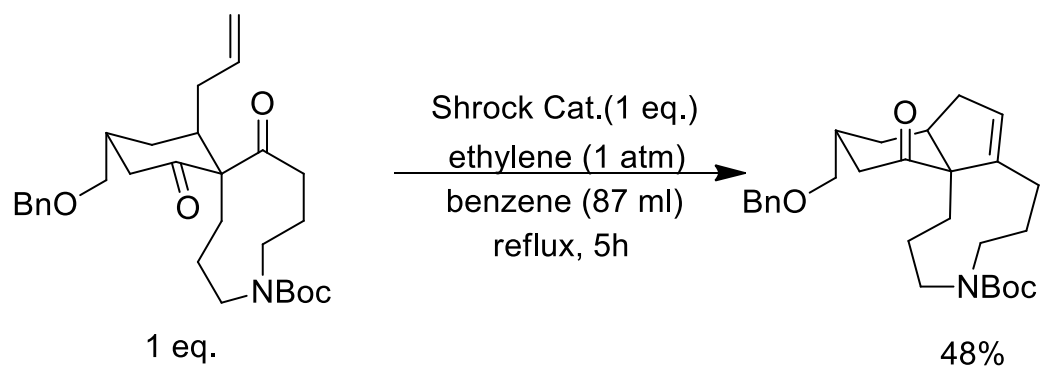




Dess-Martin oxidation:

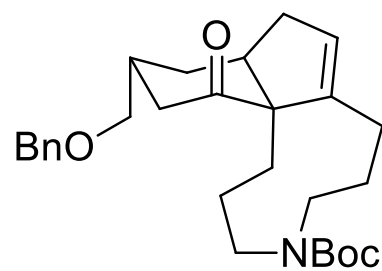




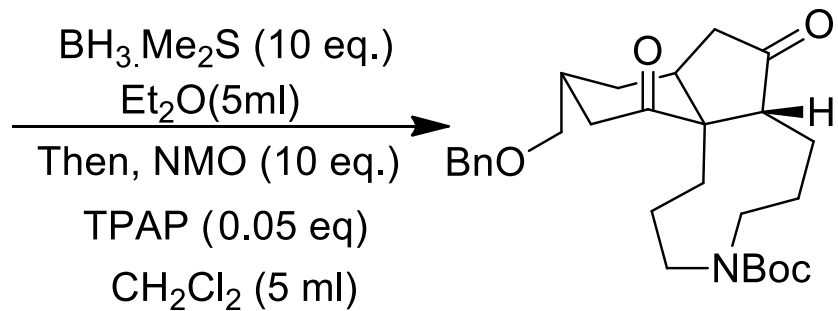


Ethylene has two important roles:

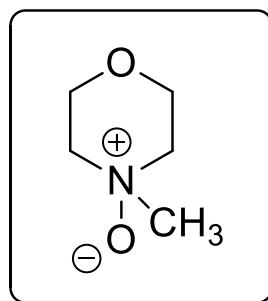
- 1) Converting bulky catalyst to more reactive species.
- 2) Avoiding side products reactions.



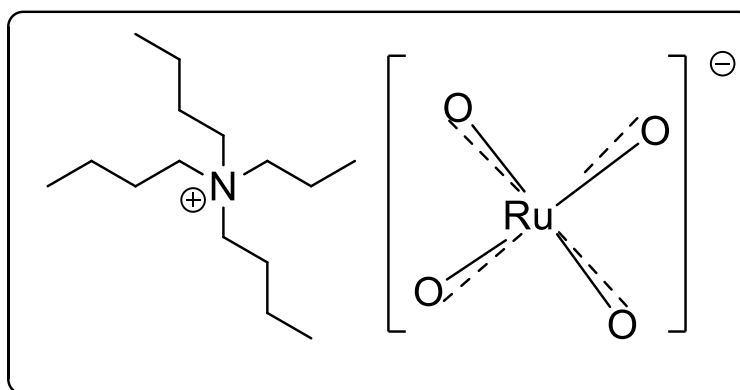
1 eq.



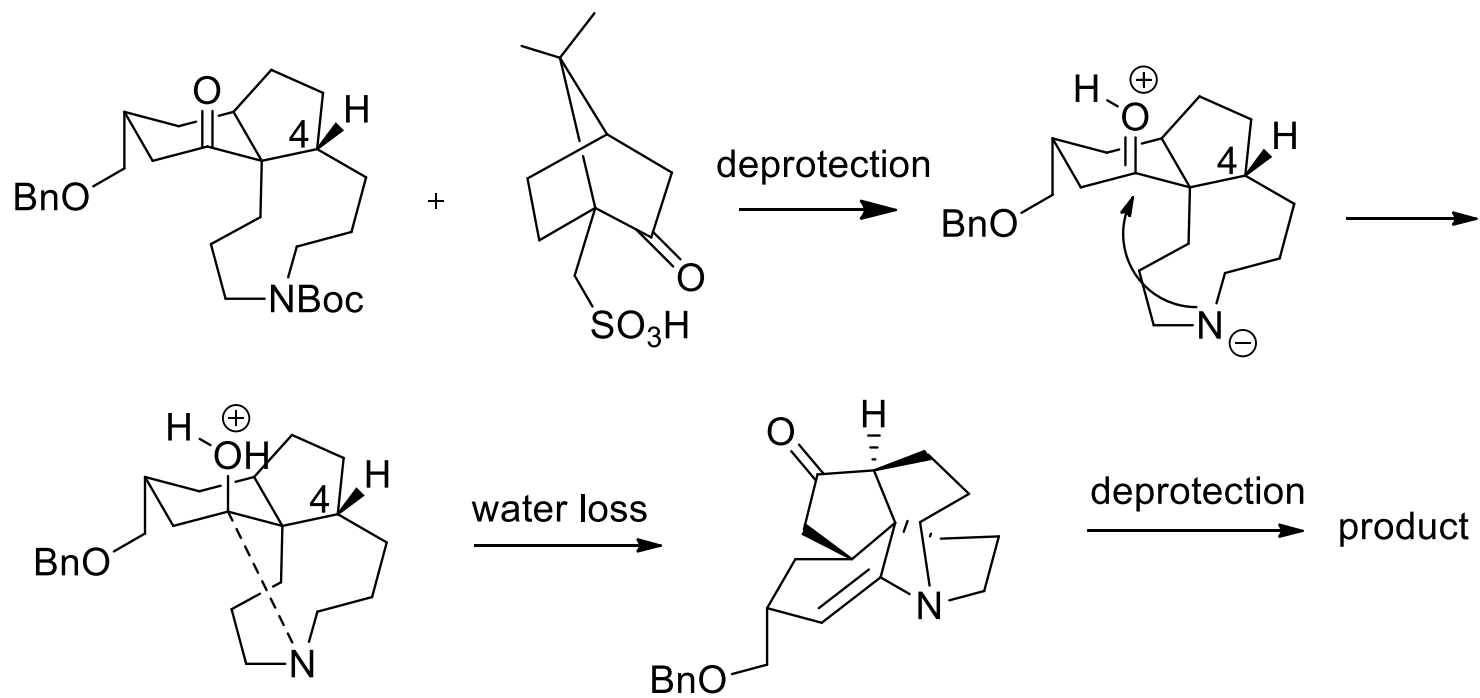
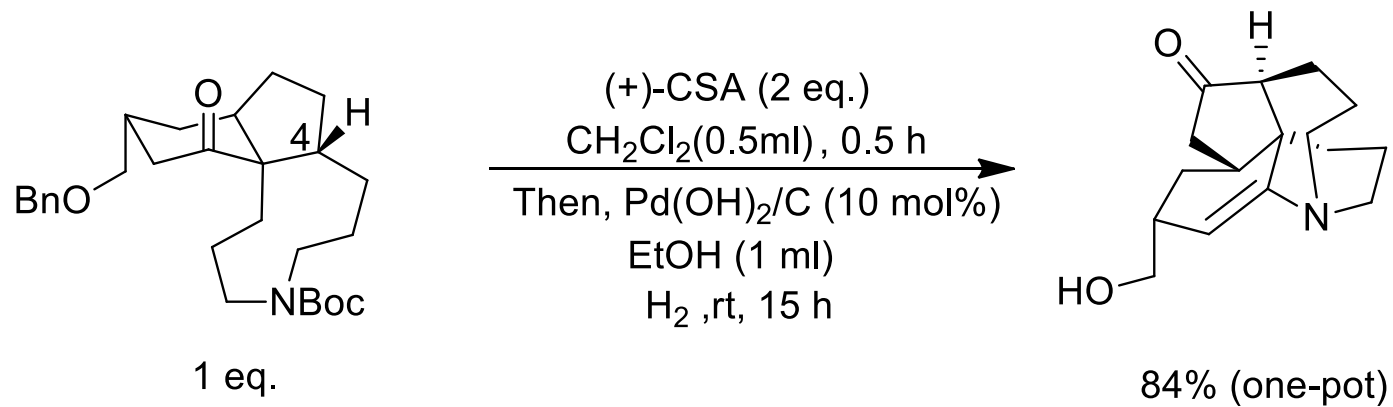
50%

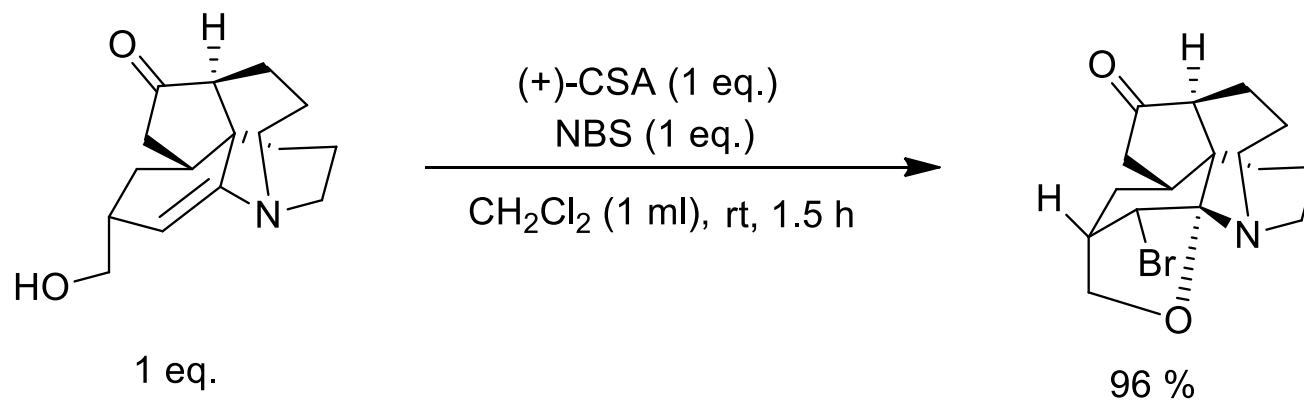


NMO

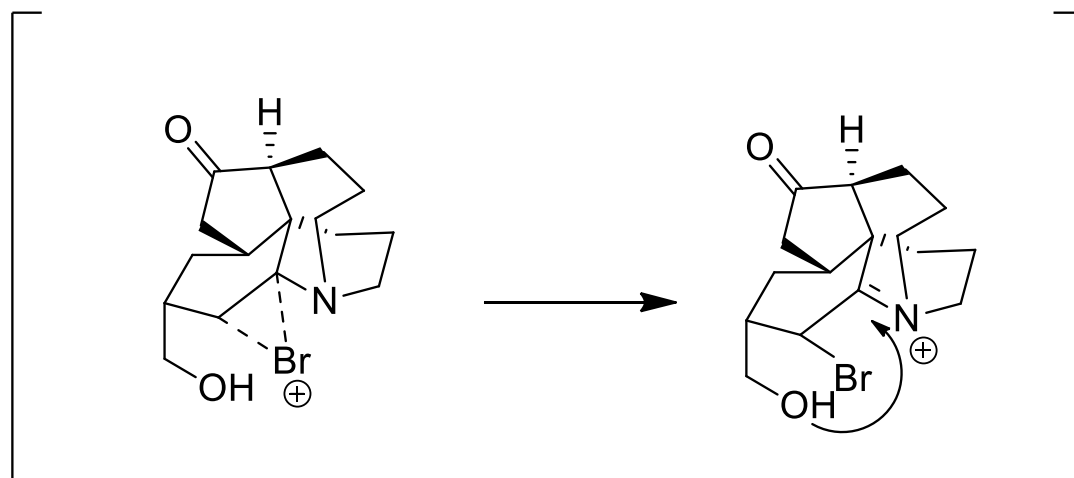
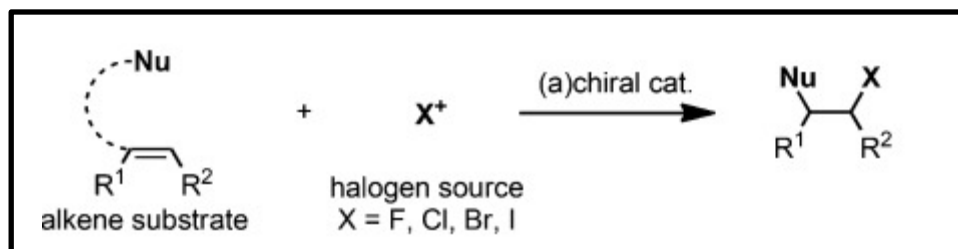


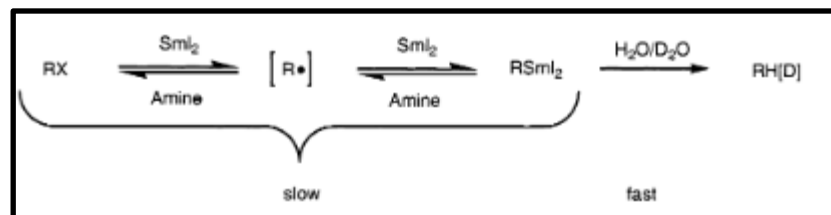
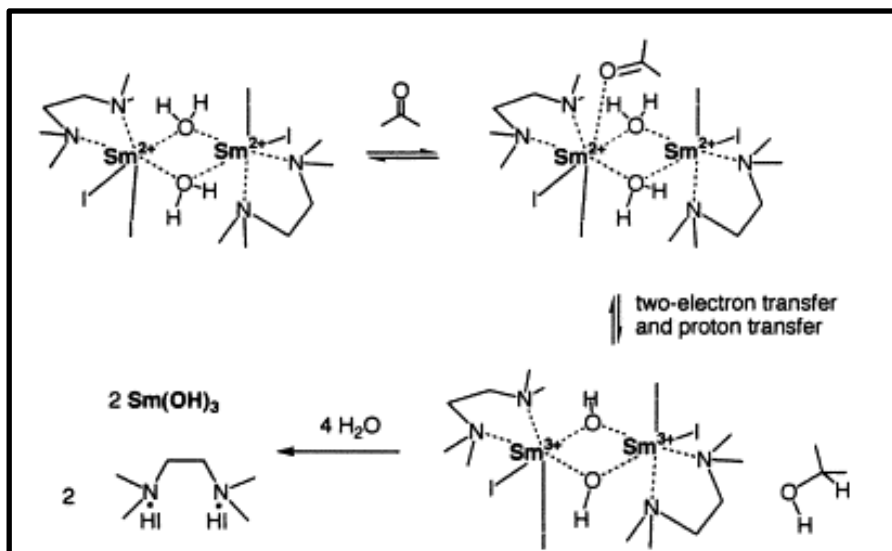
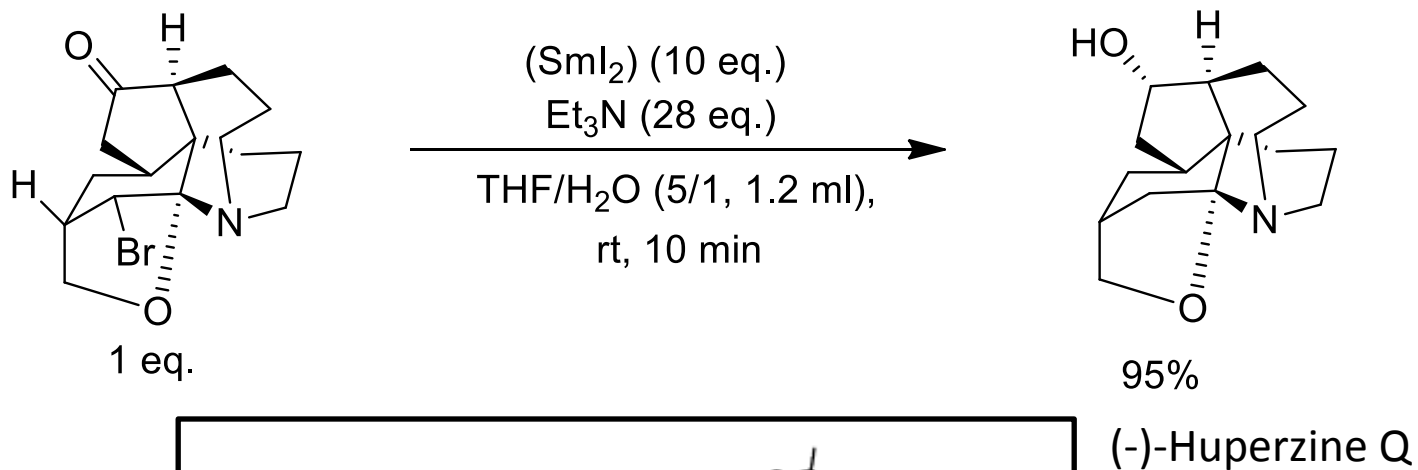
TPAP (Lay-Griffith reagent)





Alkene halofunctionalization

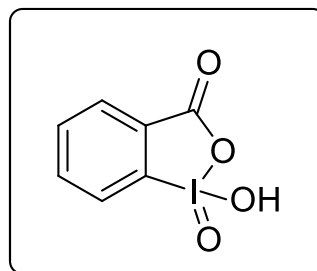
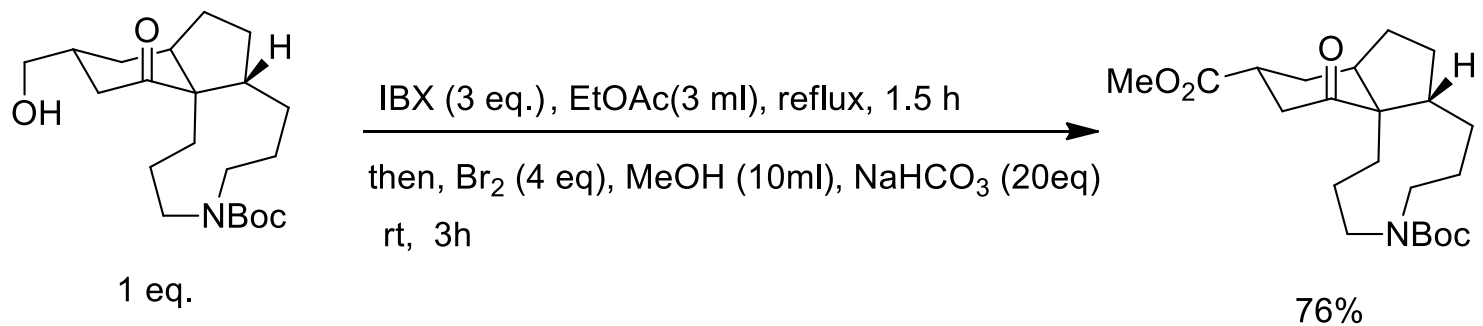




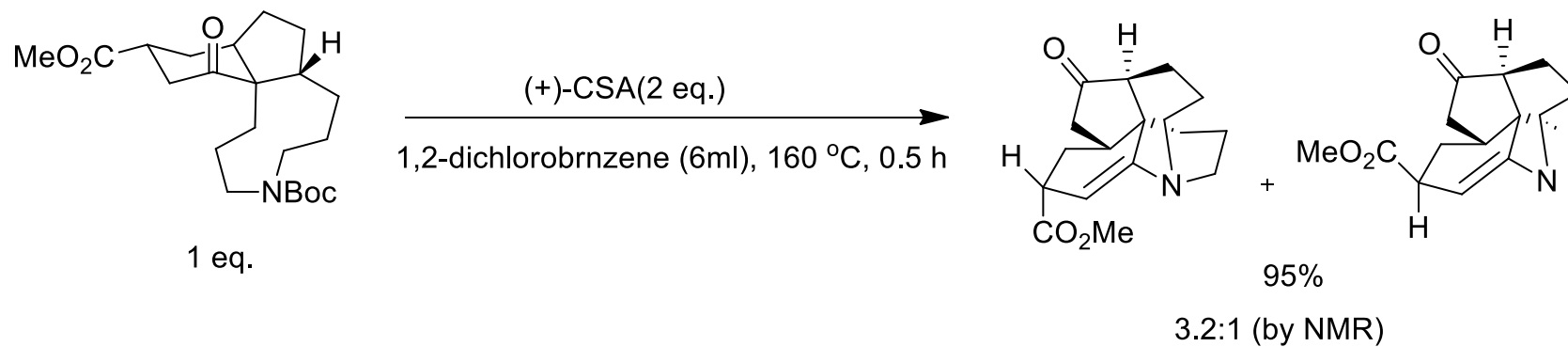
Tetrahedron Lett. **2002**, 43, 7197

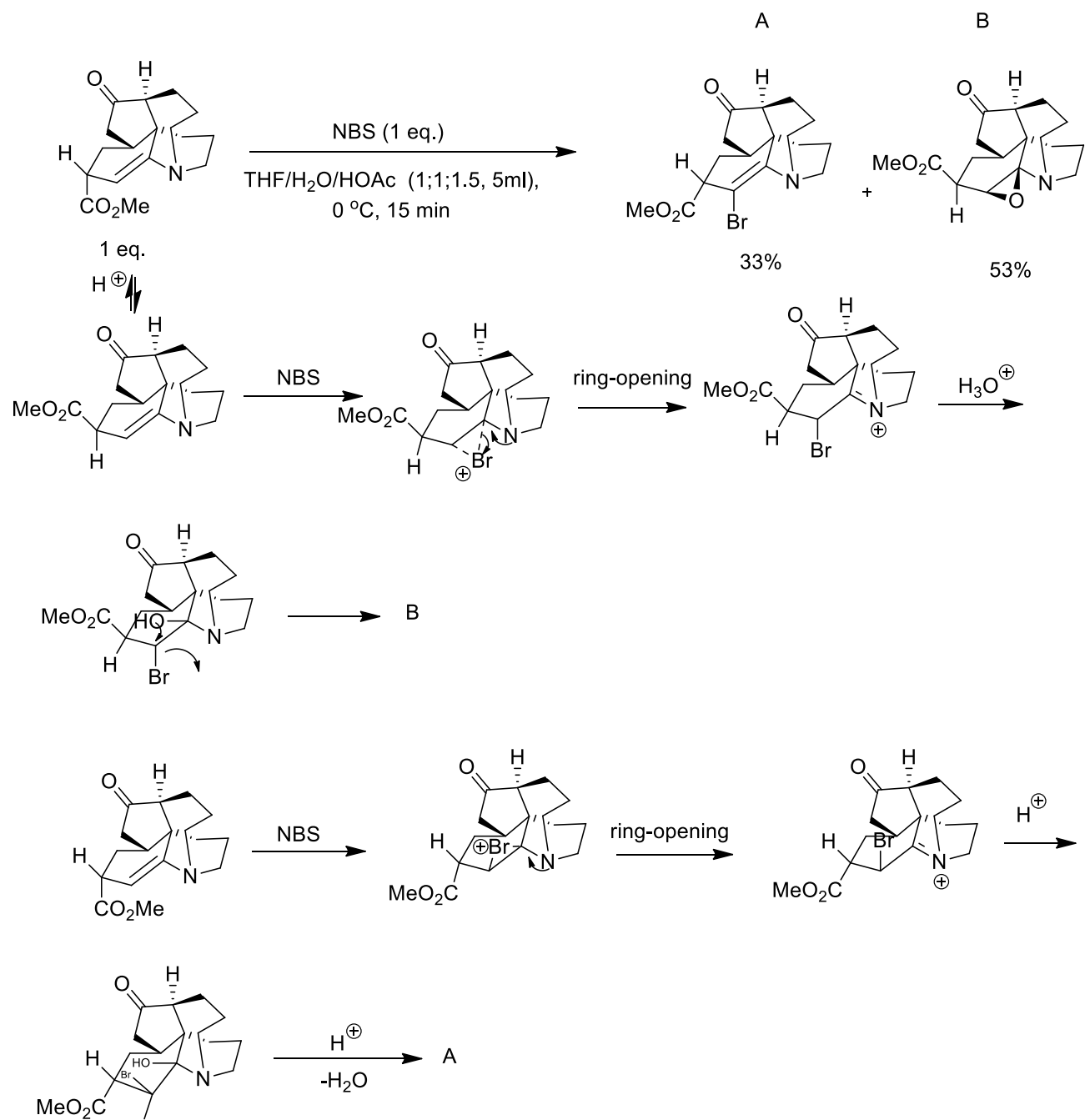
J. Org. Chem. **2003**, 68, 4870.

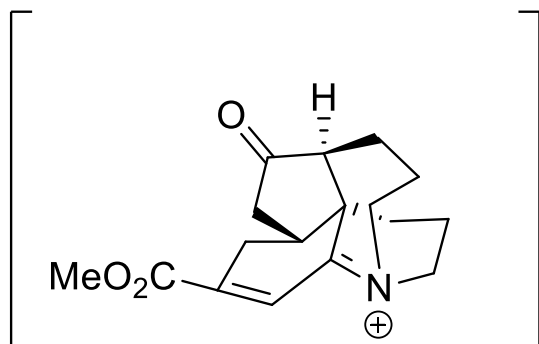
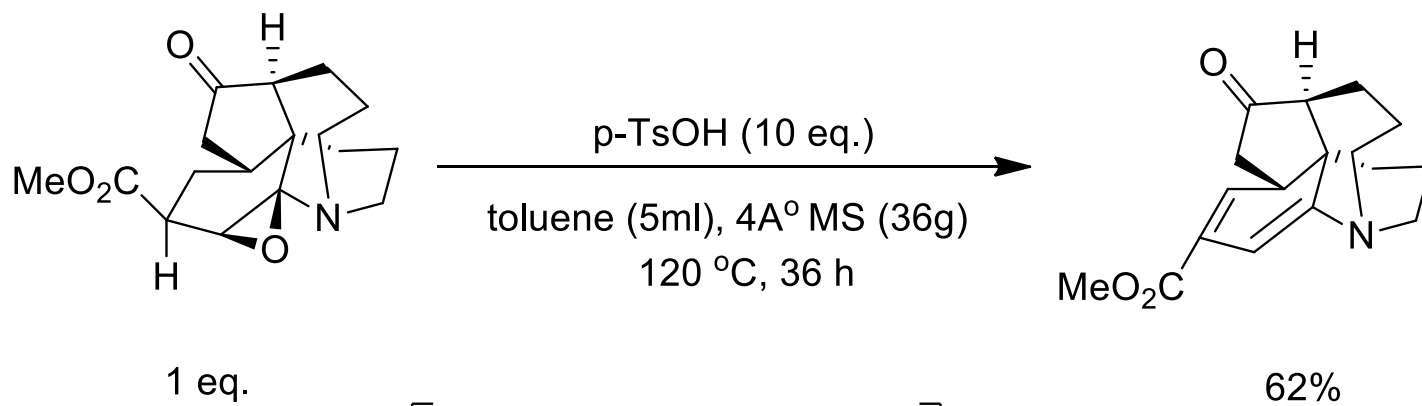
Second molecule:

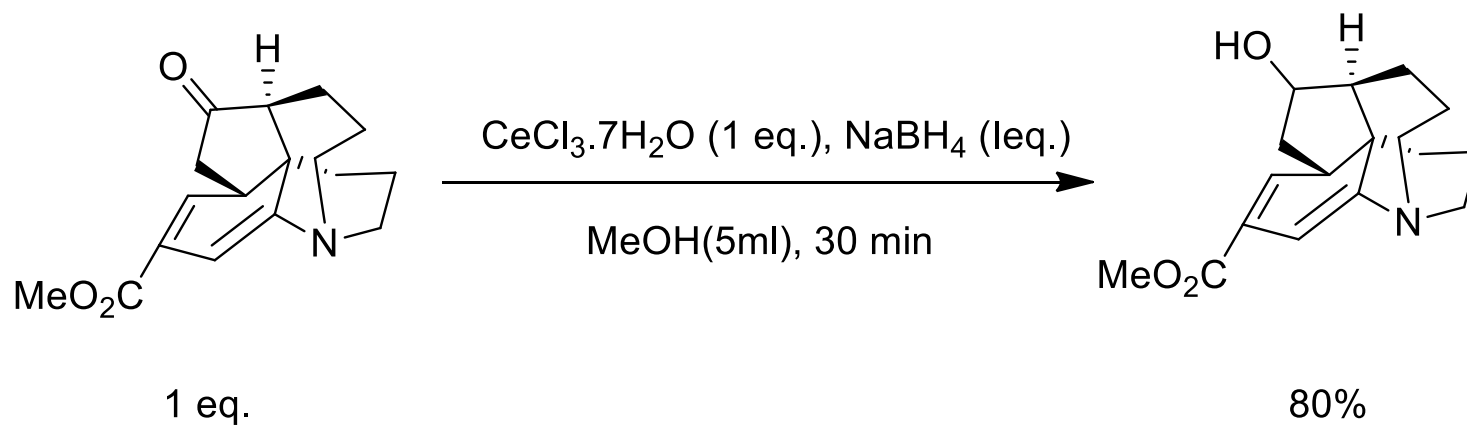


IBX



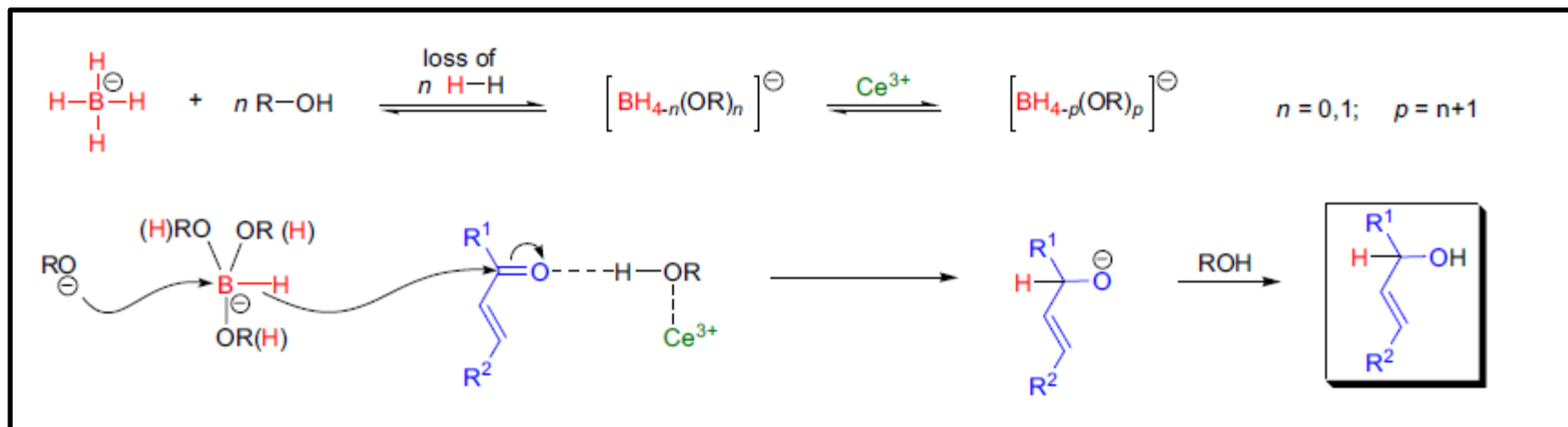


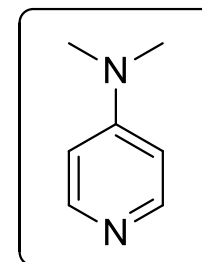
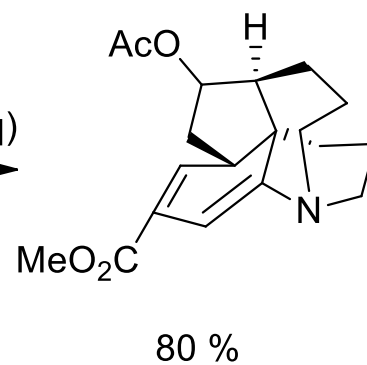
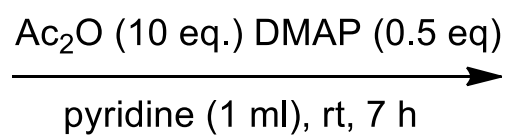
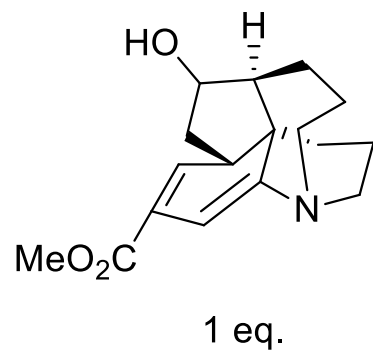




(+)-Lycopladiene B

Luche reduction:





DMAP

(+)-Lycopladiene C