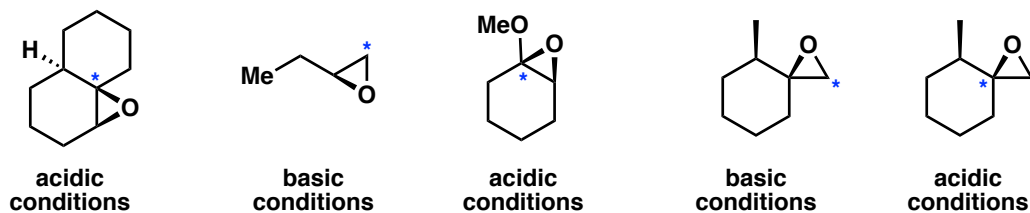
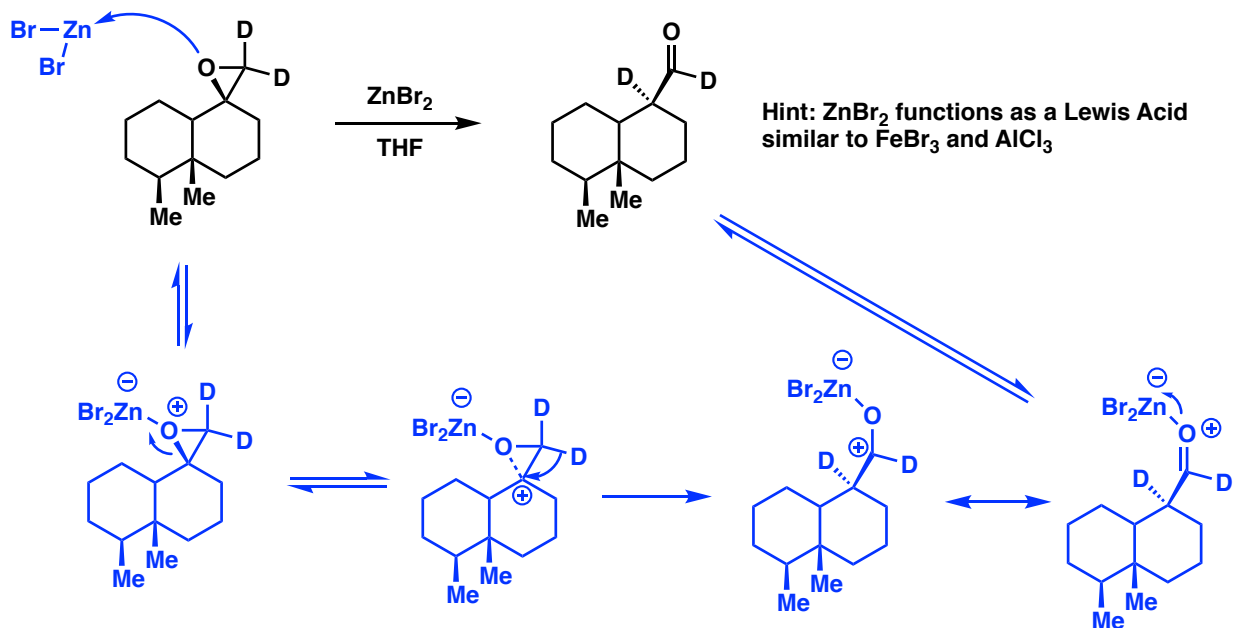


Problem Set 9 Answer Key
CHM2211

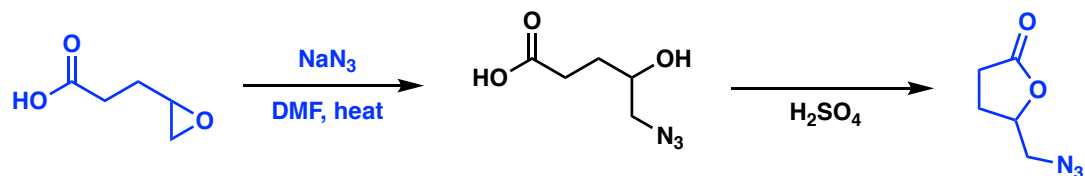
1. a. Provide the most likely atom of substitution on the epoxide under the given type of reaction conditions.



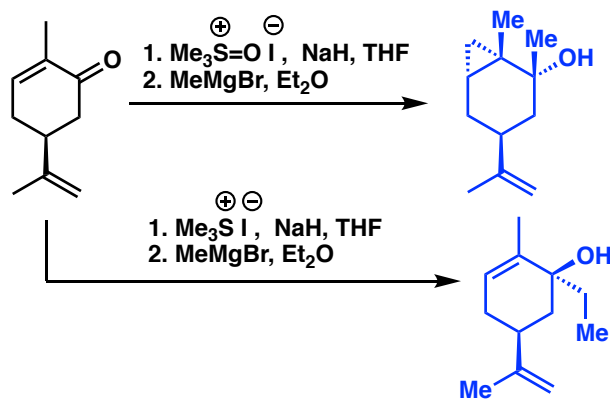
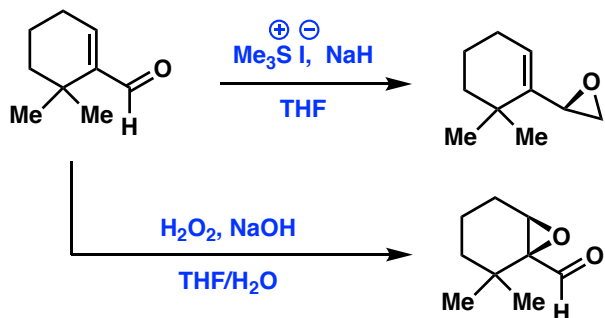
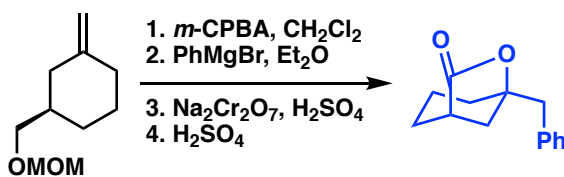
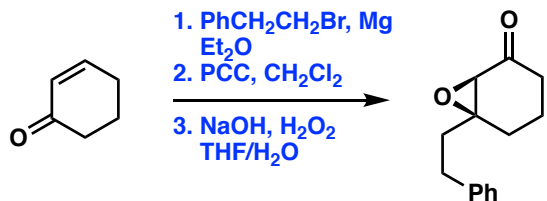
b. Epoxides can rearrange under Lewis acidic conditions promoting a hydride shift. In the example below, the starting material was deuterium labeled and then treated with $ZnBr_2$. Show a mechanism of how the product is formed.



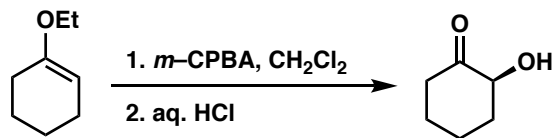
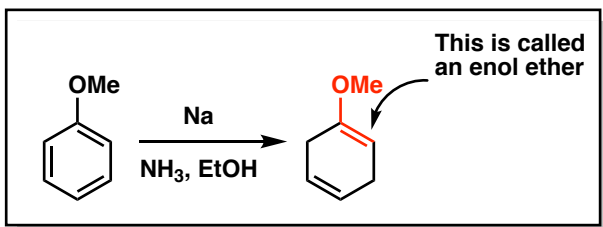
c. Provide a starting epoxide for the following sequence and then provide conditions to form the molecule shown. Then predict the product of the final transformation.



2. Provide reagents and/or products to the reactions below.

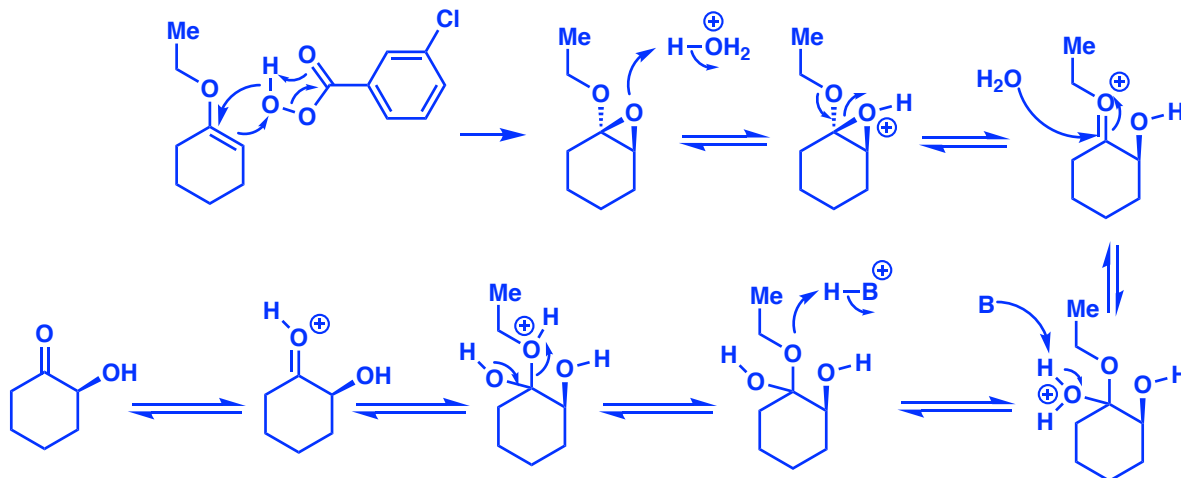


3. The Rubottom oxidation is an epoxidation reaction on a functional group called an enol ether. You have seen enol ethers before as the product of Birch reductions. Provide a mechanism for the epoxidation of **A** and then provide a mechanism for its subsequent hydrolysis (Hint: the product of epoxidation can be considered an acetal)

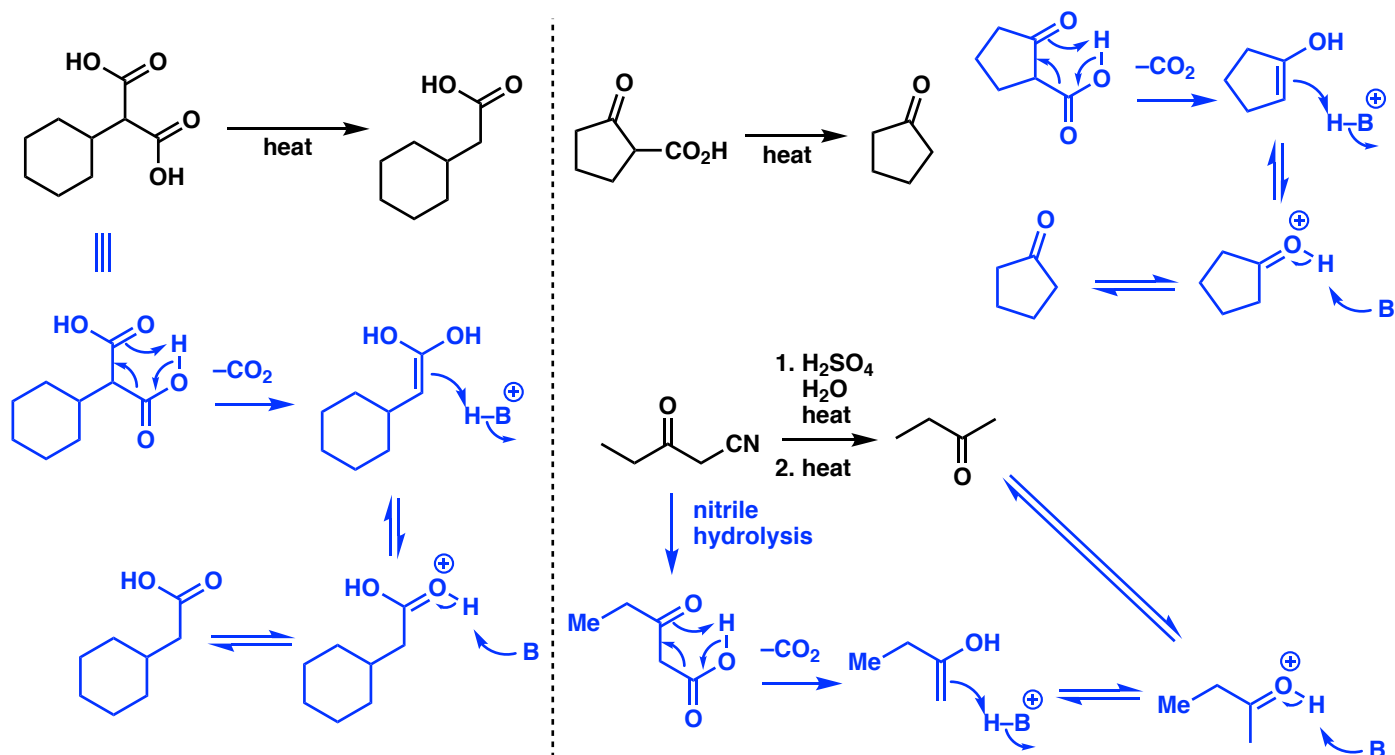


Rubottom Oxidation!

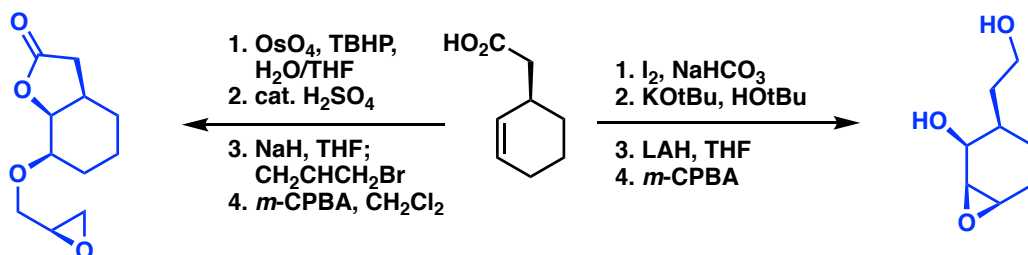
show mechanism!



4. a. Provide a mechanism for the reactions shown below.



b. Provide products for the following transformations and mechanisms where indicated.



5. Provide a forward synthesis of the following compounds from pyrrole and units of 3 carbons or fewer (a retrosynthesis will help you!!).

