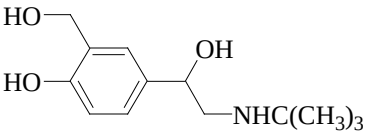
Problem Set #8

Chemistry 3231
October 23, 2001

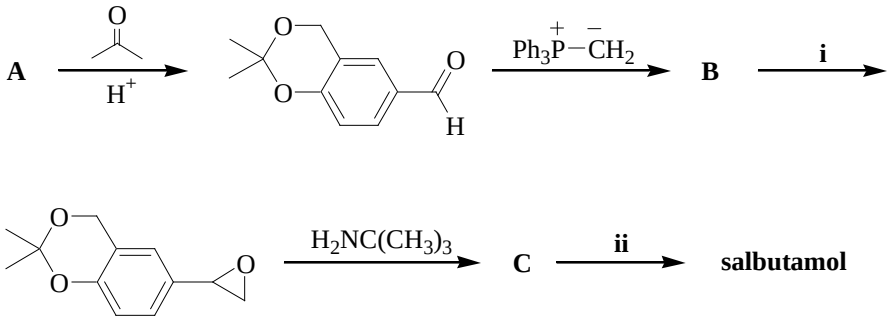
1. The metal hydride reduction of 4-*tert*-butylcyclohexanone can yield two possible products.

   (a) Suggest structures for the products.
   (b) Would you expect them to form in equal amounts?
   (c) Which product is expected to be more stable? Why?

2. Salbutamol is a common prescription drug used to alleviate the symptoms associated with asthma. Provide the missing reagents (**i-ii**) and intermediate products (**A**-**C**) for the following reaction sequence leading to salbutamol.

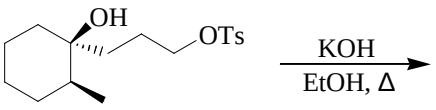


salbutamol

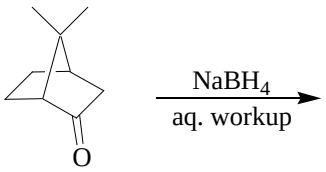


3. Give the expected products from each of the following reactions:

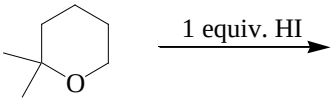
(a)



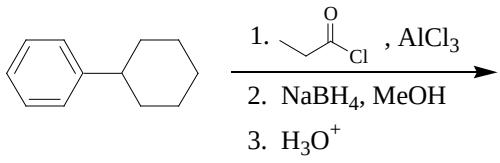
(b)



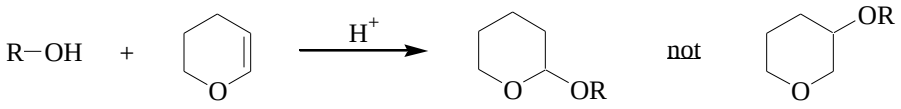
(c)



(d)



4. Tetrahydropyranyl ethers are formed under acid-catalyzed conditions from alcohols and dihydropyran. Provide an explanantion for the observed regiospecificity of this reaction. In other words, why is the other possible regioisomer not formed?



5. Provide syntheses for each of the following transformations: