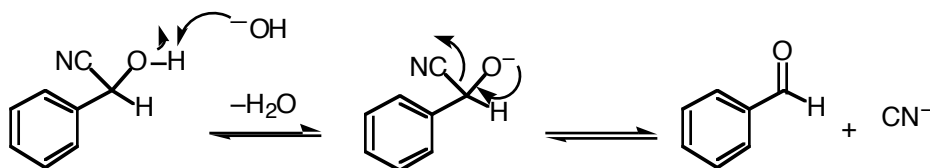


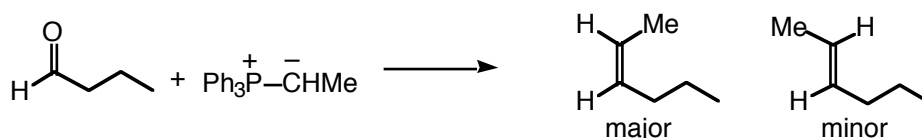
Aldehydes and Ketones, Problem Set #4, Answer Key

1. The equilibrium is shifted to the side of the hydrate (to the right), it relieves angle strain. The sp^3 hybridization ideally is 109° and sp^2 is 120° . 109° is closer to 60° (an equilateral triangle) than 120° so the equilibrium is shifted to the right.

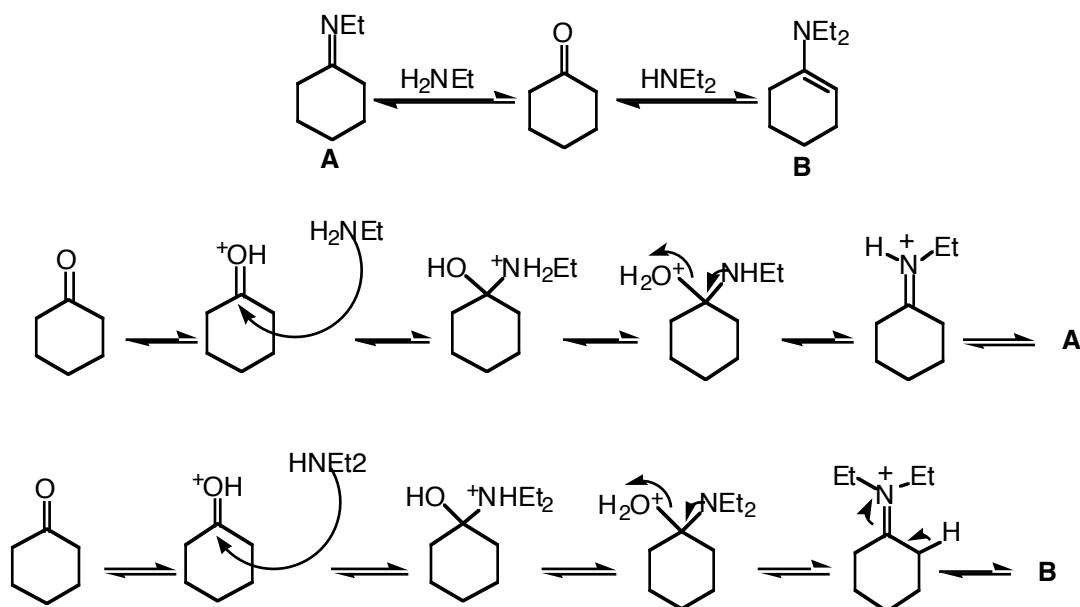
2.



3.

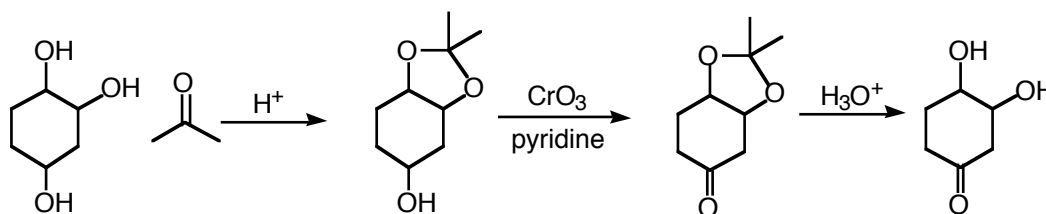


4.

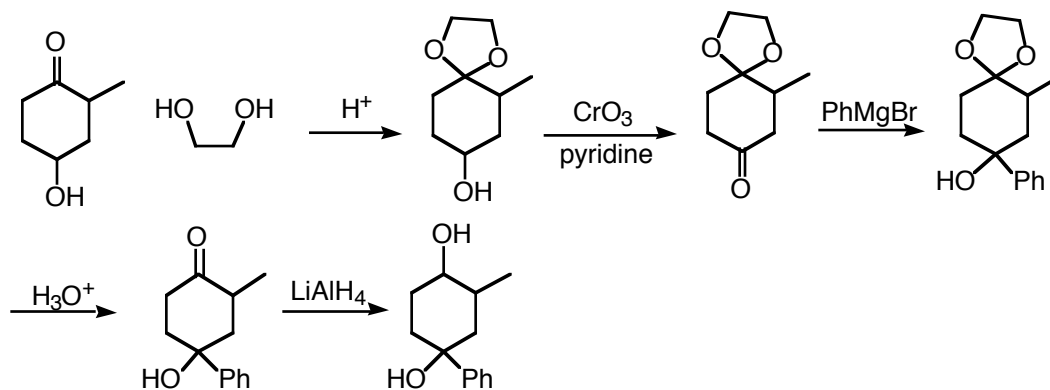


5. The steric hindrance of placing a sp^3 center between the two other quaternary ones pushes the equilibrium to the left.

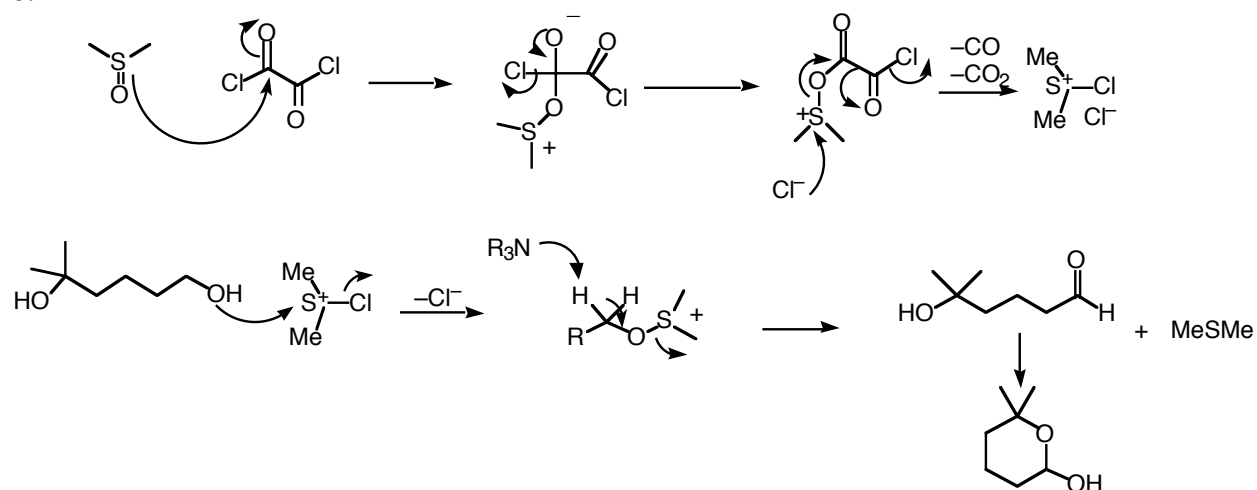
6. Show what reagents you would use to synthesize the following. Multiple steps are required.



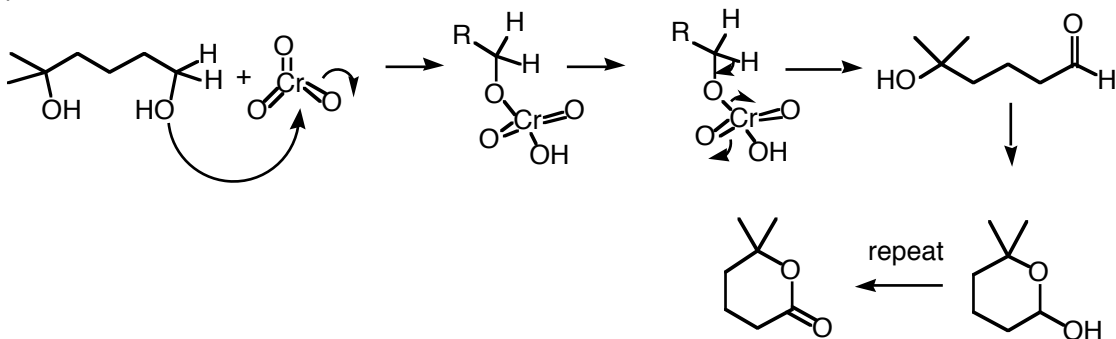
7. Show what reagents you would use to synthesize the following. Multiple steps are required.



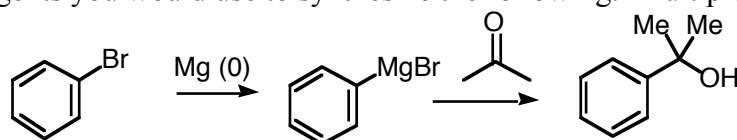
8.



9.



10. Show what reagents you would use to synthesize the following. Multiple steps are required.



11. The reaction below is flawed because the product after the first addition eliminates to form the ketone. This ketone then reacts faster than the ester to produce the tertiary alcohol.
12. Acetals can not be formed in base. They stop at the hemiacetal stage.