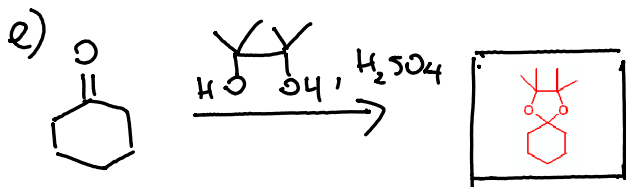
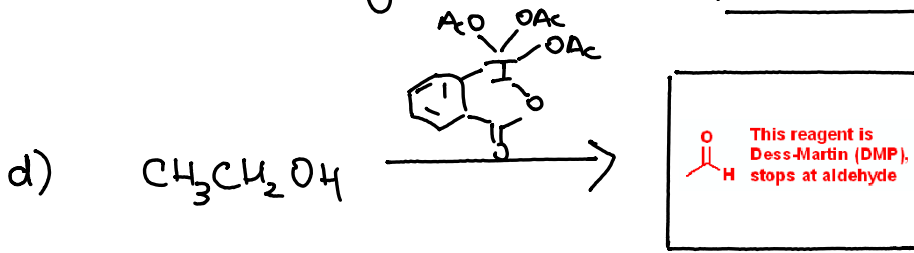
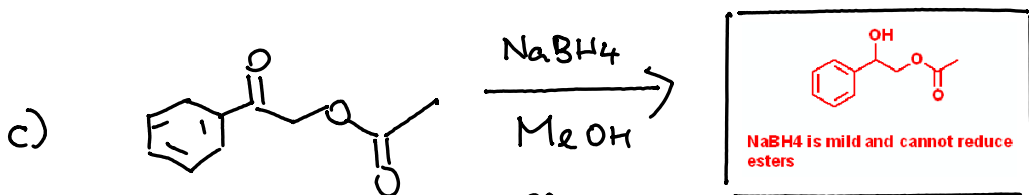
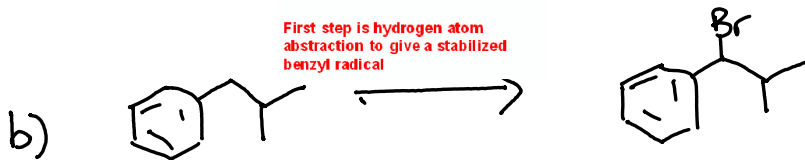
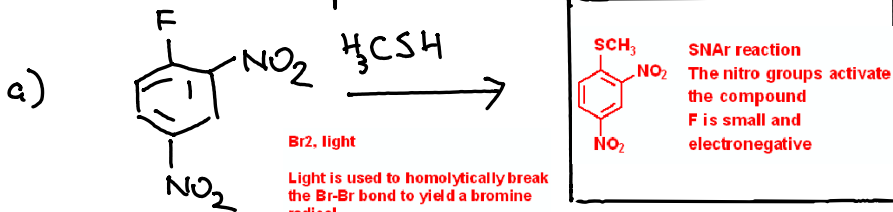


# Chem 436- Practice Midterm 1

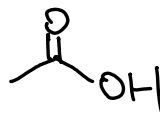
1. Fill in the reagents or products in the boxes provided



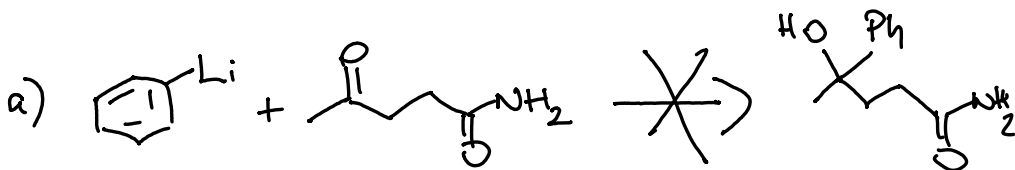
Acid-catalyzed ketal formation

Notice similarity between this diol and ethylene glycol introduced in class

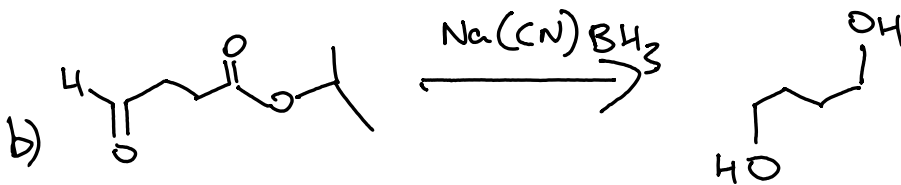
Any oxidizing agent strong enough such as Jones would be accepted here.



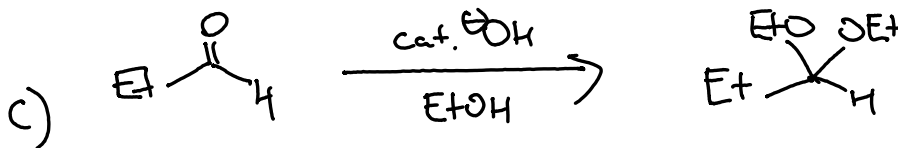
2. Explain in one to two sentences why the following reactions would not yield the desired products.



**Phenyllithium acts as a nucleophile and as a strong base. This reaction does not work because deprotonation of the NH<sub>2</sub> protons would take place before addition to the ketone.**



**Na(CN)BH<sub>3</sub> is the mildest of the 3 hydride reducing agents we have introduced in class so far. It is not strong enough to reduce esters or aldehydes**



**This is a base-catalyzed reaction. Under these conditions the hemiacetal forms since -OH (hydroxyl) is not a good leaving group.**

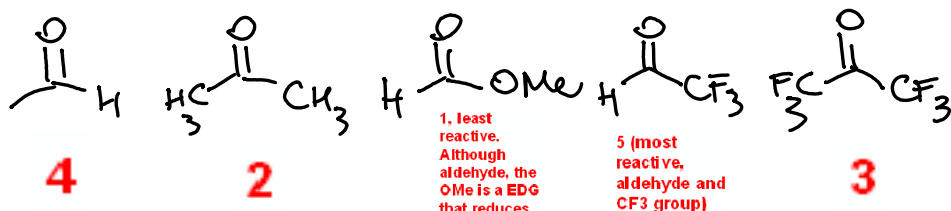
3. Arrange the following carbocations in order of increasing stability.

Most stable,  
benzylic and  
allylic

As shown in lecture, these two have near identical stabilities

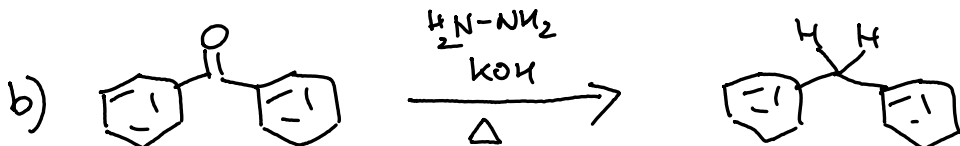


4. Arrange in order of increasing reactivity towards  $\text{LiAlH}_4$  reduction.



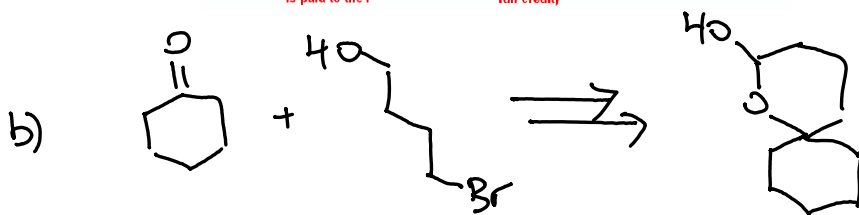
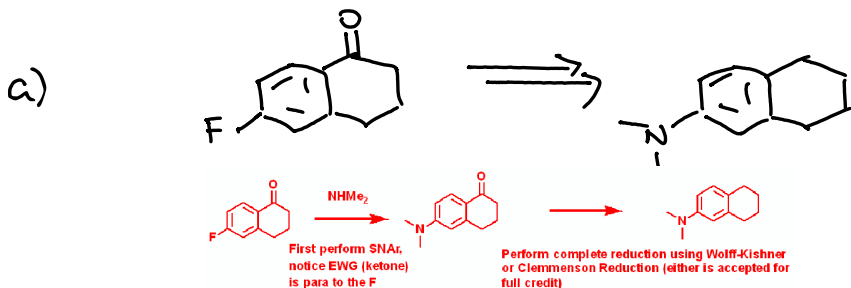
1. least reactive. Although aldehyde, the OMe is a EDG that reduces positive charge character of the carbonyl

5. Draw the arrow pushing mechanism for the following reactions.



These mechanisms are directly from class, please see lecture notes

6. Propose a synthesis for the following products using the starting material that is provided



The alcohol can be directly protected or converted to an aldehyde and then protected as an acetal

After this, the bromo can be converted to a Grignard and then added to the ketone

This will then cyclize to give the desired product

