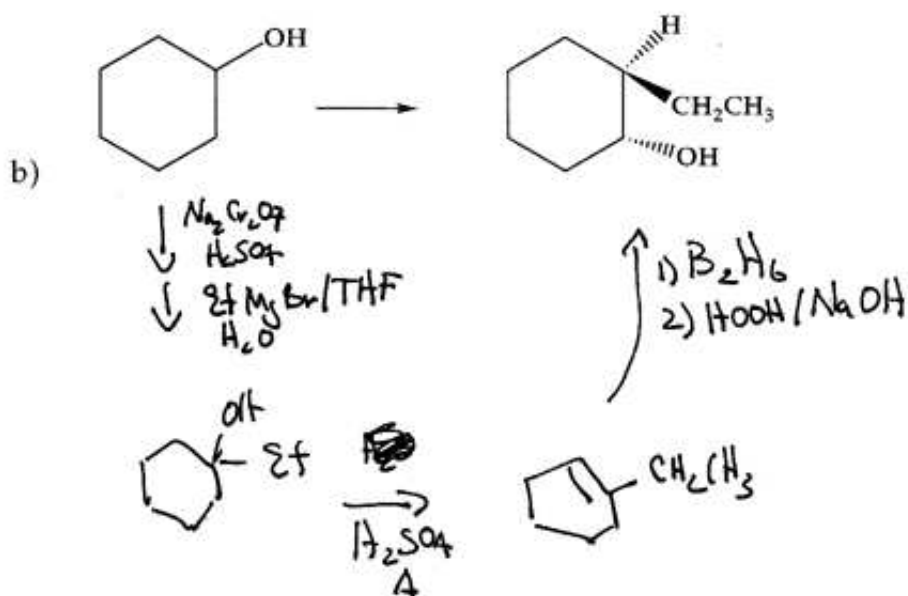
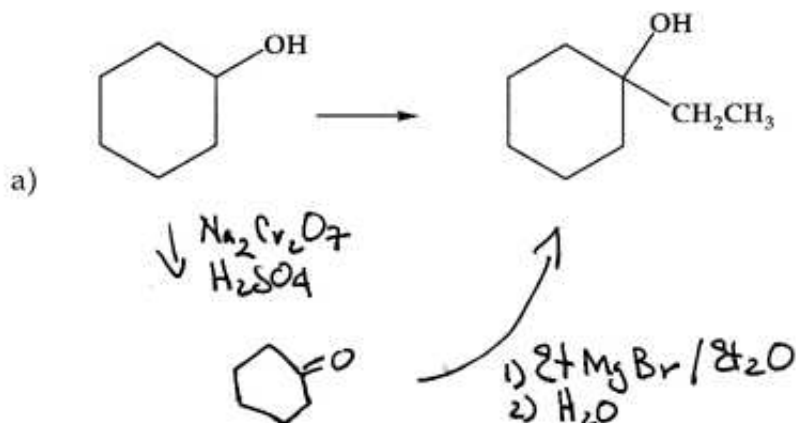


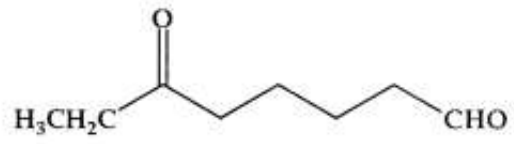
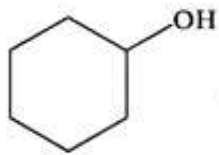
Chemistry 3331-100
Organic Chemistry/Dr. Barney Ellison
Thursday: Oct. 24th @ 7:00pm → 9:00/2nd Exam/Hale 270

Name: Key (please print)

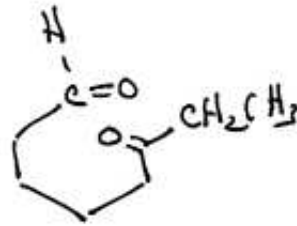
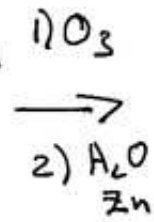
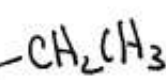
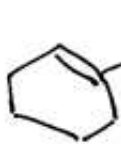
1. (15 pts) Show how the following compounds can be synthesized from cyclohexanol and any necessary organic/inorganic reagent.



c)

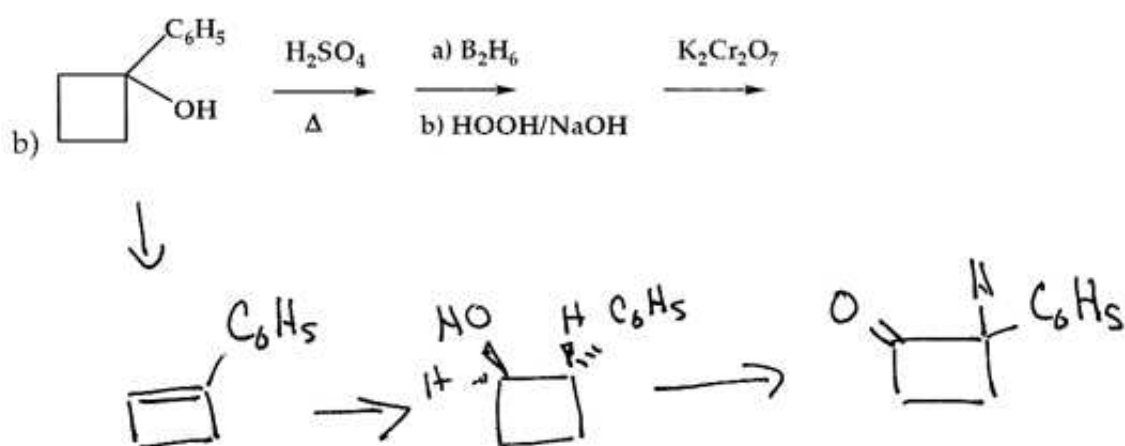
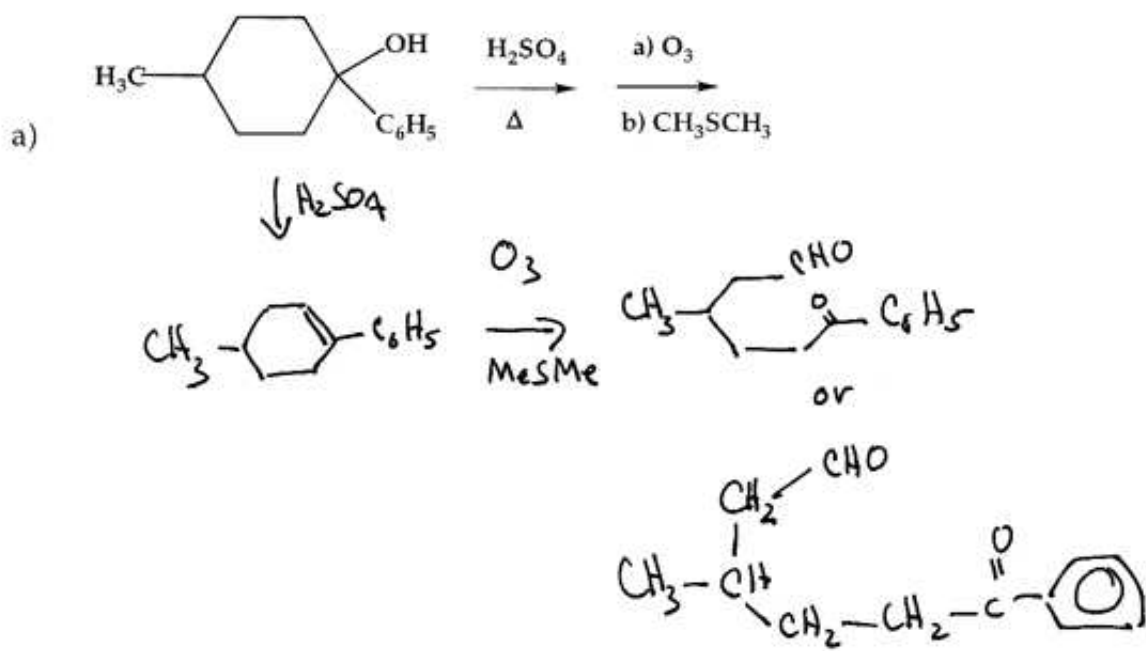


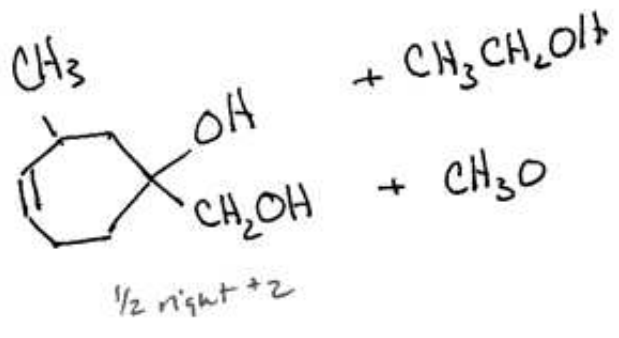
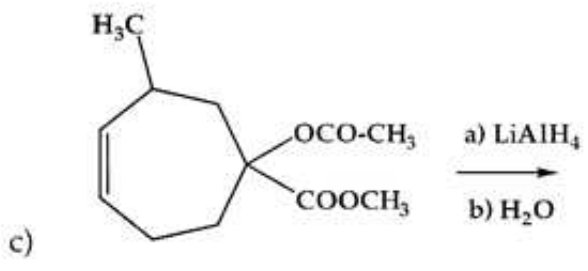
via part (b)



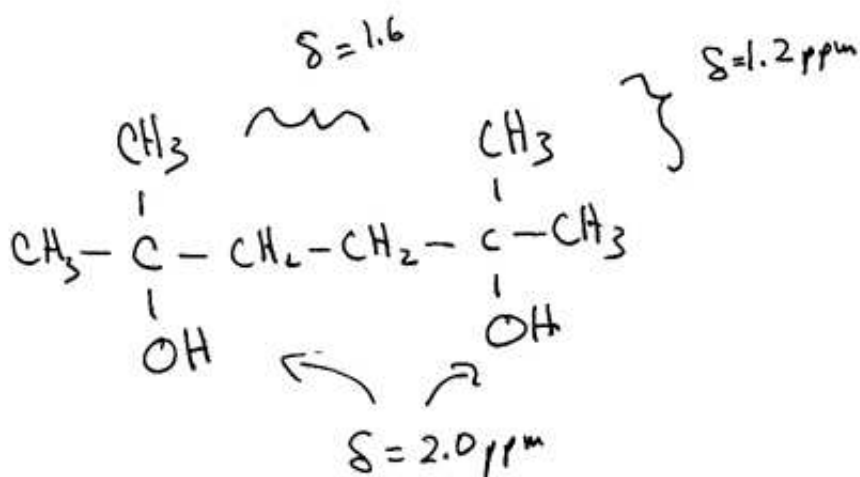
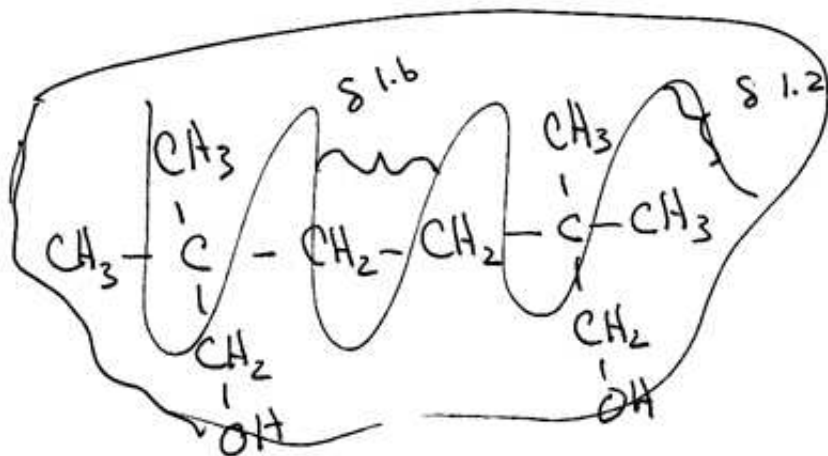
|||

2. (15 pts) Predict the product in each case, showing stereochemistry where appropriate.



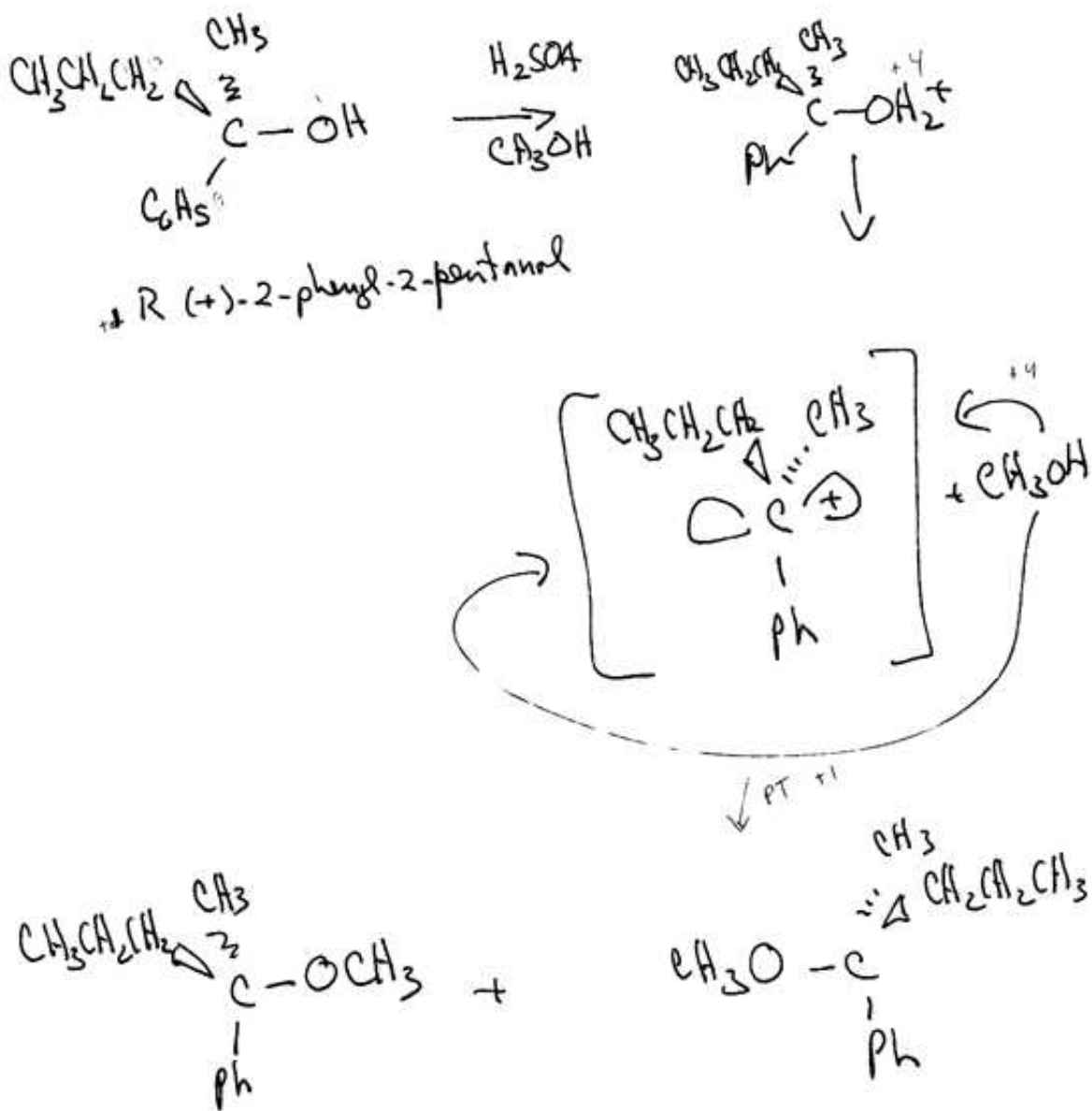


3. (10 pts) A diol with formula $C_8H_{18}O_2$ does not react with HIO_4 . The 1H NMR spectrum contains three singlets at δ 1.2 ppm (12 protons), δ 1.6 ppm (4 protons), and δ 2.0 ppm (2 protons). What is the structure of the diol?

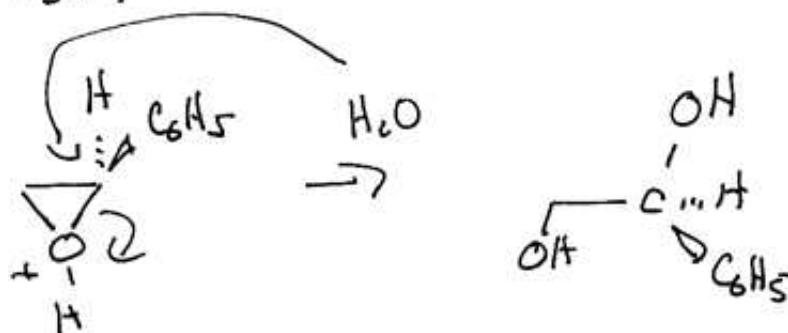
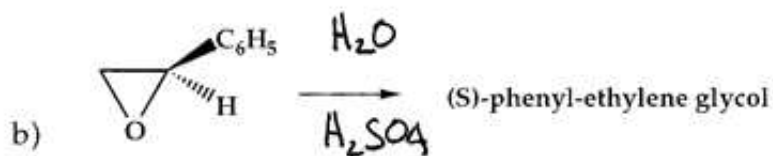
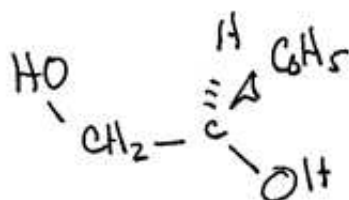
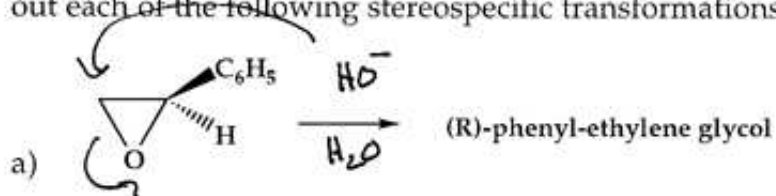


\rightarrow Can't be a vicinal diol since no HIO_4 rxn.

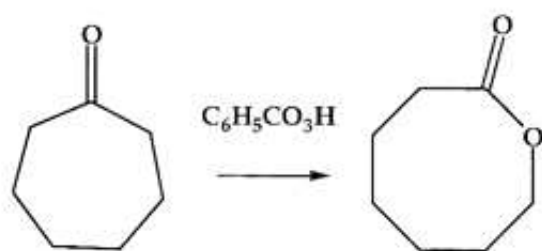
4. (10 pts.) When (R)-(+)-2-phenyl-2-pentanol is allowed to stand in methanol containing a few drops of H_2SO_4 , racemic 2-methoxy-2-phenylpentane is formed. Suggest a reasonable mechanism.



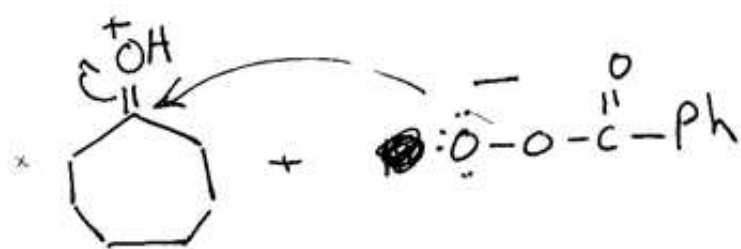
5 (10 pts.) Select reaction conditions that would allow you to carry out each of the following stereospecific transformations.



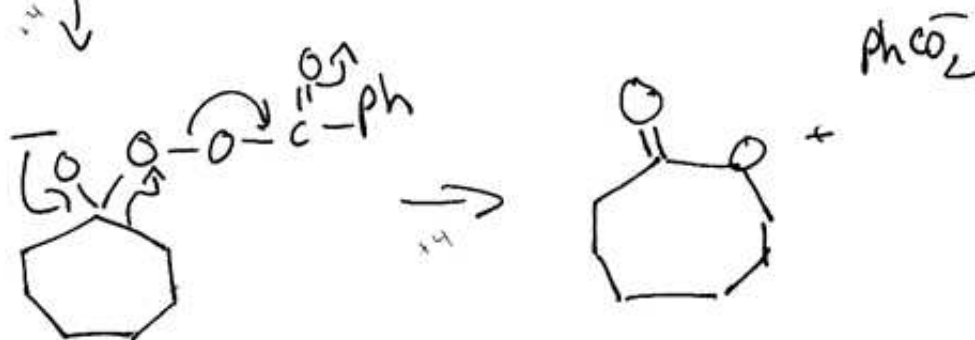
6. (10 pts) What is the mechanism of the Baeyer-Villiger reaction shown below?



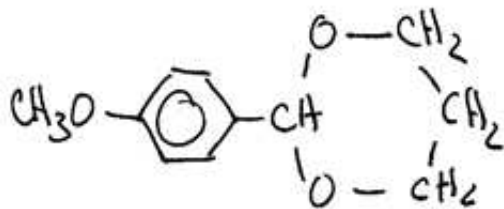
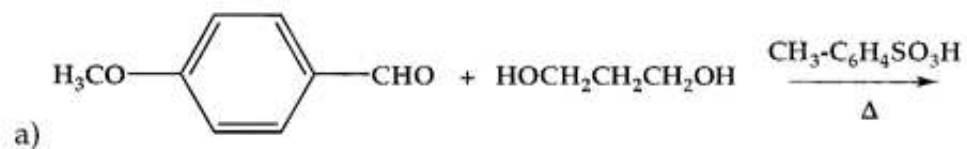
✓✓



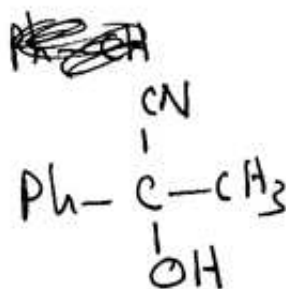
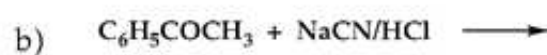
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7. (10 pts) What is the principal product in each reaction?

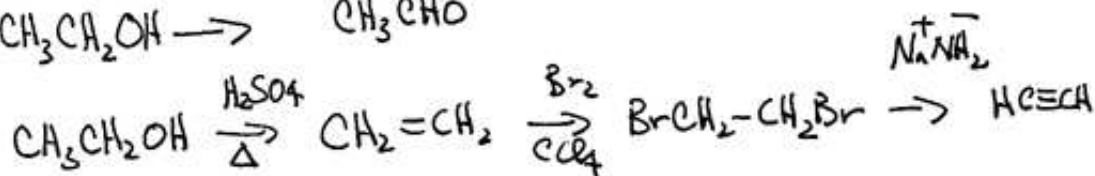
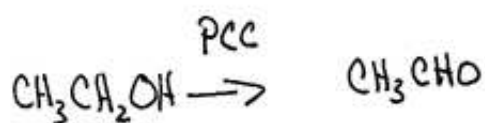
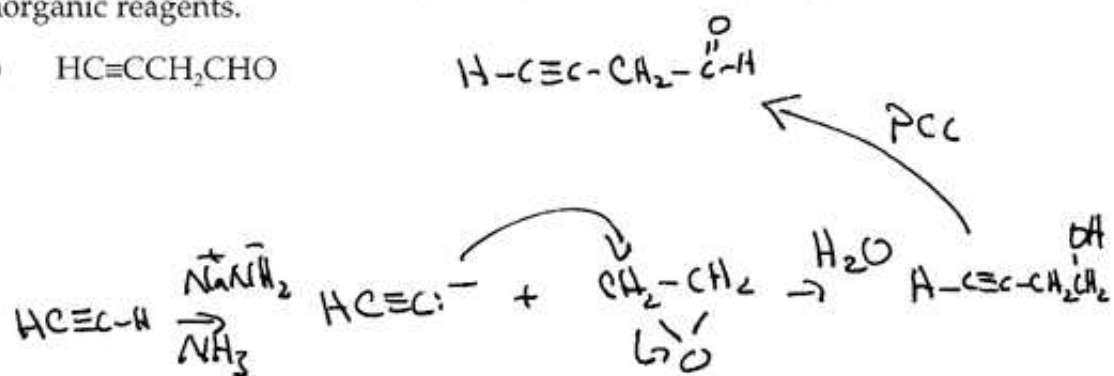


1 for hemi
3 for HO~OH

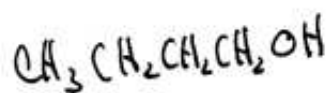
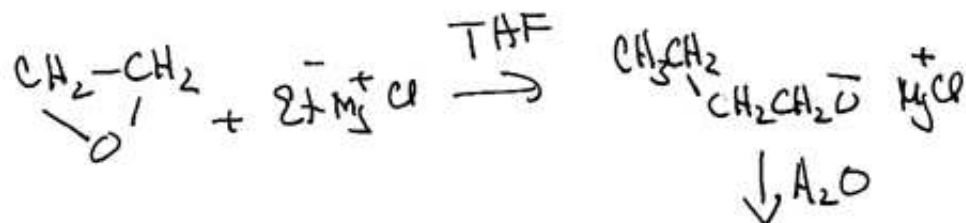
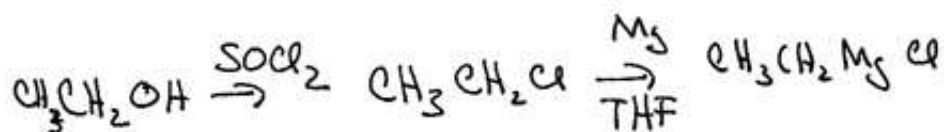


8. (10 pts) Using ethanol as the source of all carbon atoms, describe a syntheses of all the following using any necessary organic or inorganic reagents.

a) $\text{HC}\equiv\text{CCH}_2\text{CHO}$



b) $\text{CH}_3\text{CH}_2\text{CH}_2\text{CH}_2\text{OH}$



9. (10 pts) Suggest a reasonable mechanism for each of the following reactions.

