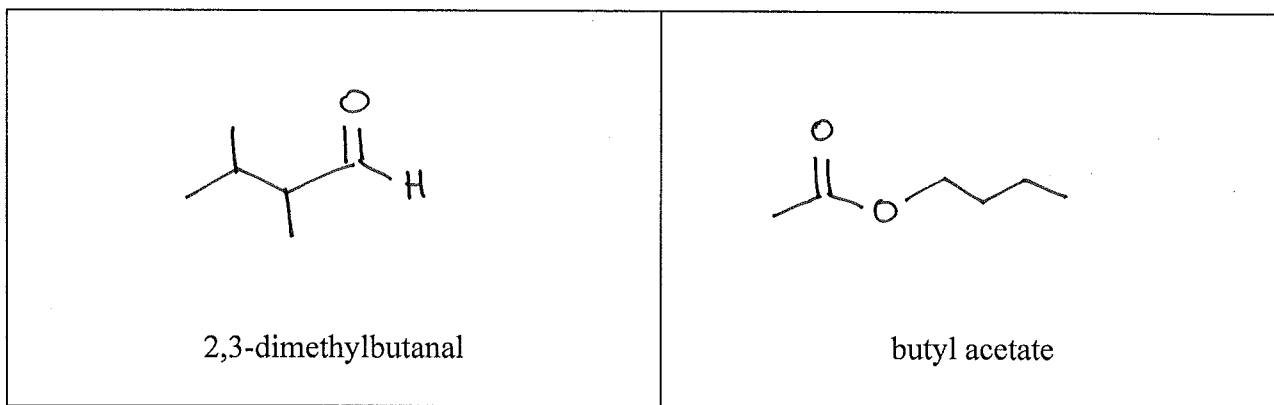
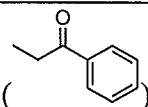


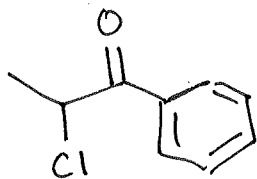
61. Nomenclature. Please give name for structure or structure for name.



102. When you treat ethylphenylketone () with excess chlorine ( $\text{Cl}_2$ ), a different product is obtained when acid is present than when base is present.

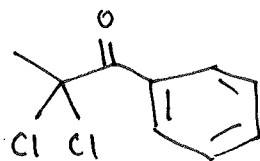
(a) Clearly state what the product of the reaction will be in each case.

in acid



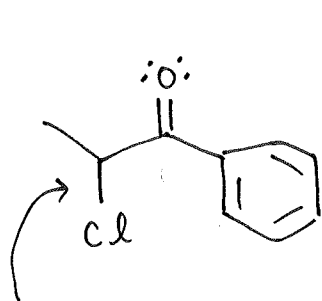
monochlorinated

in base

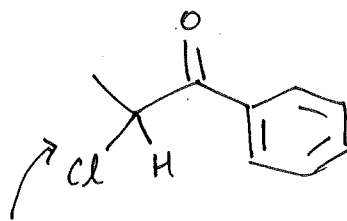


dichlorinated

(b) **WHY** do the two reactions give different products? Please give a detailed *explanation* rather than a restatement of the facts.

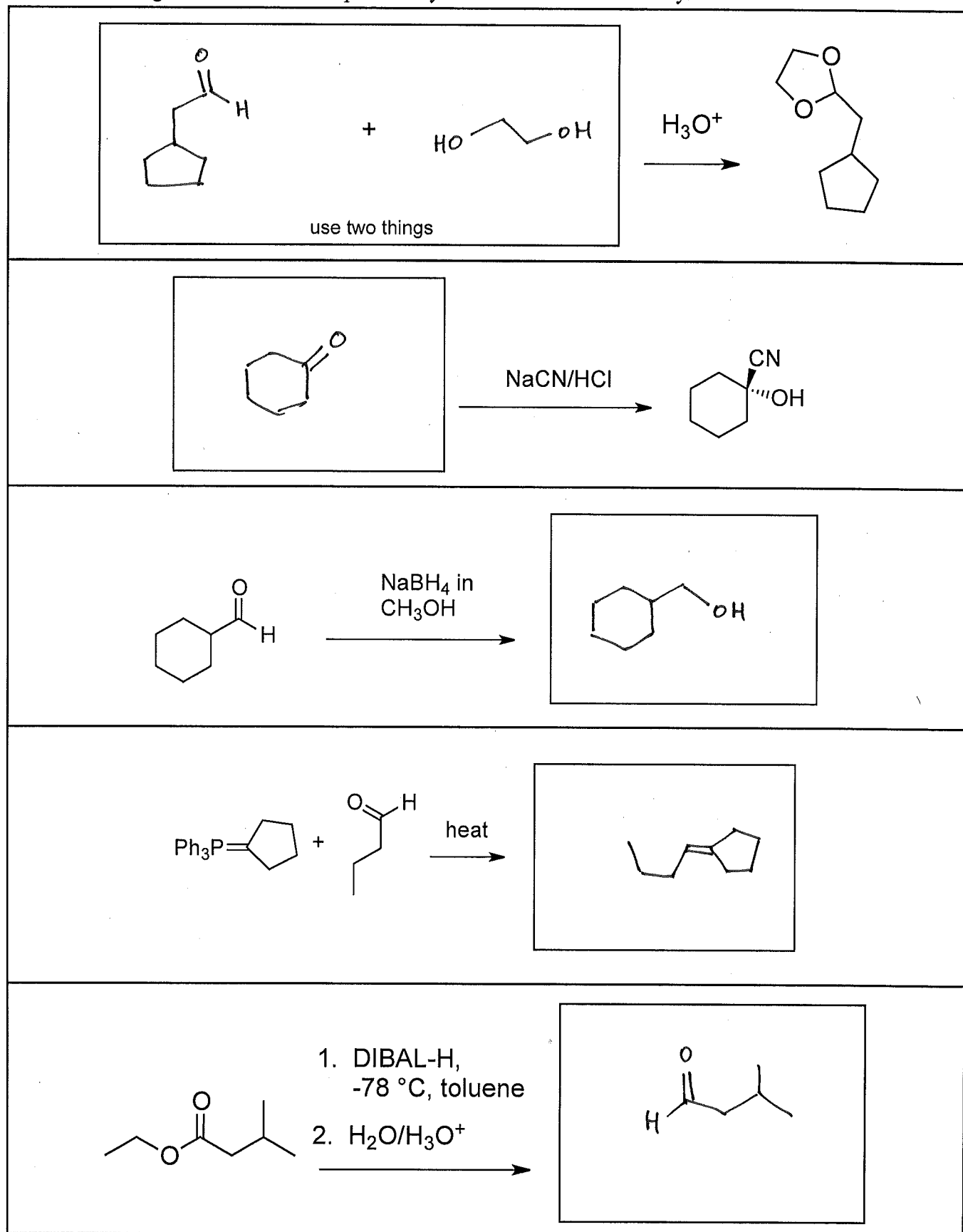


Electron-withdrawing group decreases the basicity of the carbonyl group. The carbonyl group won't get protonated, and enol won't be formed

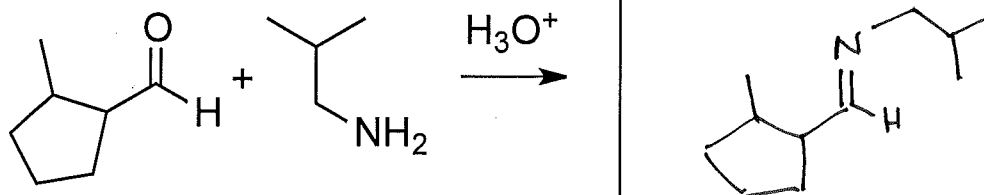
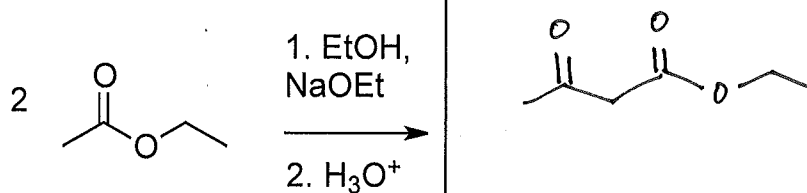
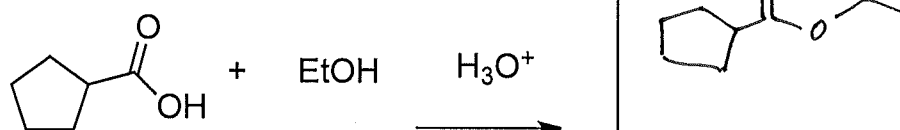
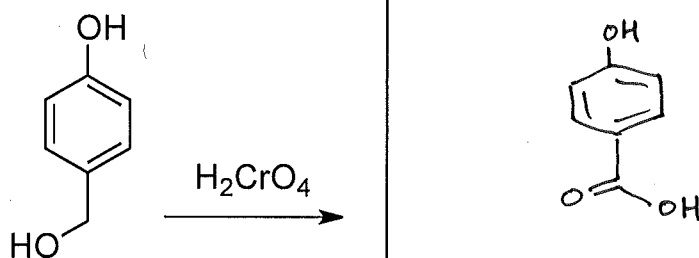
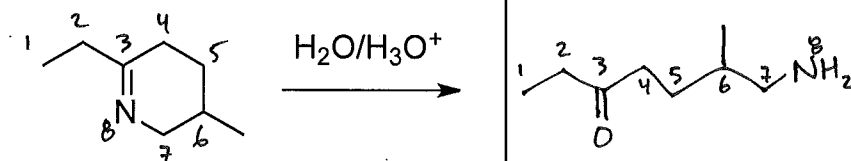


electron-withdrawing group increases the acidity of the remaining  $\alpha$  hydrogen, making enolate formation easier in the subsequent step.

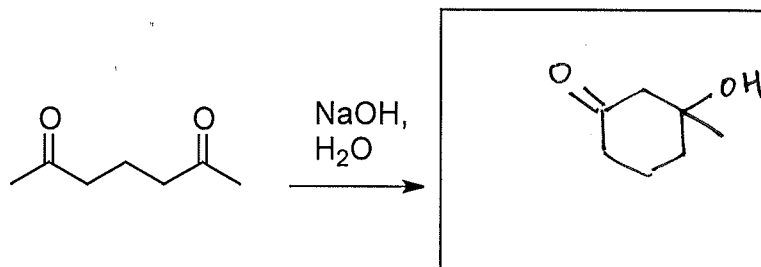
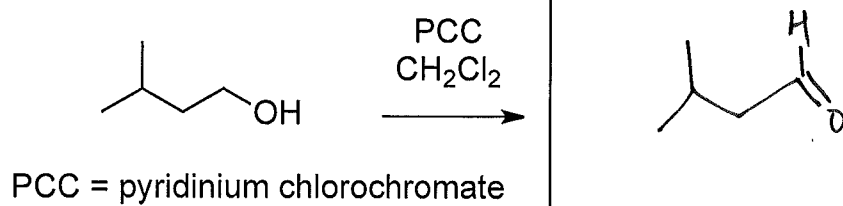
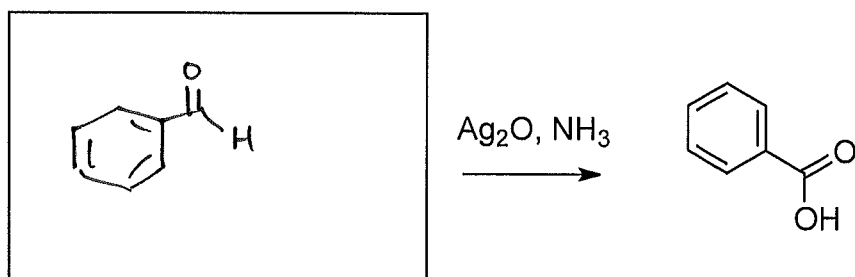
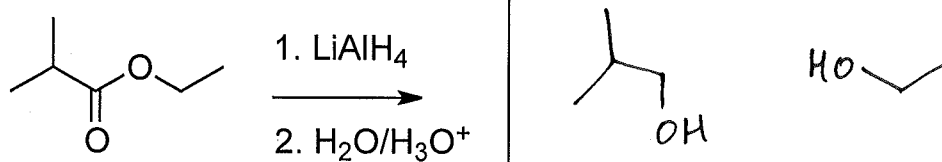
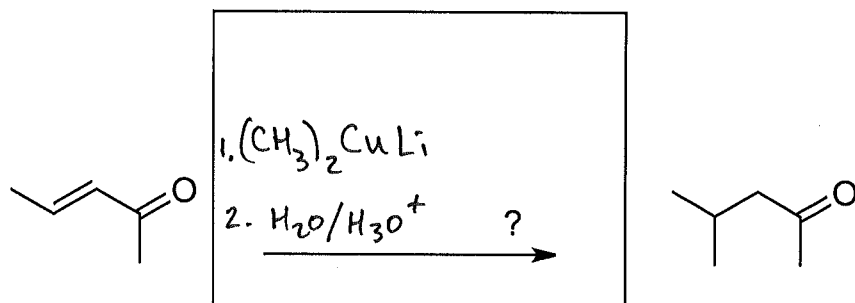
403. Fill in any of the missing starting material(s), reagent(s), and/or dominant **organic** product(s) for each single reaction. Please specifically denote all stereochemistry.



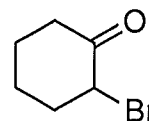
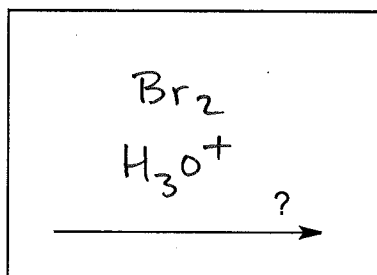
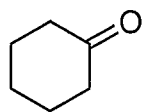
Question 3 continued.



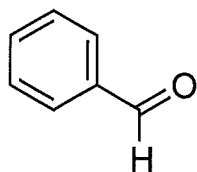
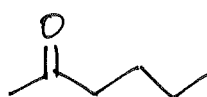
Question 3 continued.



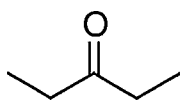
Question 3 continued.



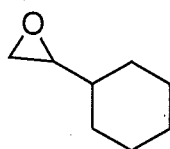
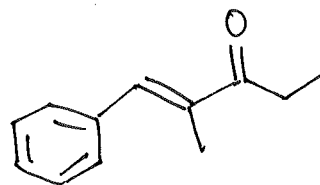
1.  $\text{LiNHPr}_2$  ("LDA")  
2. 1-bromopropane



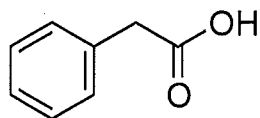
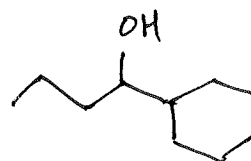
+



$\text{NaOH}$ ,  
heat

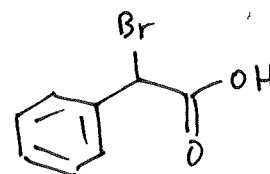


1.  $(\text{CH}_3\text{CH}_2)_2\text{CuLi}$   
2.  $\text{H}_2\text{O}/\text{H}_3\text{O}^+$

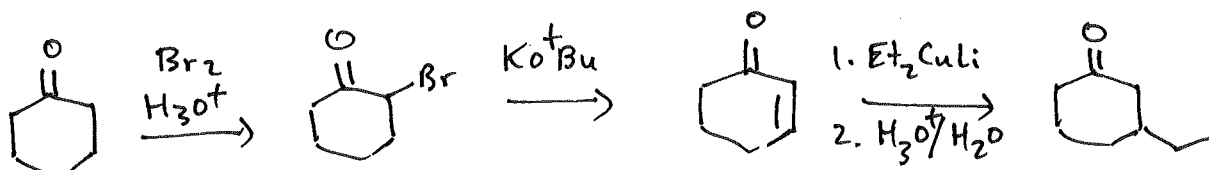
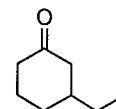
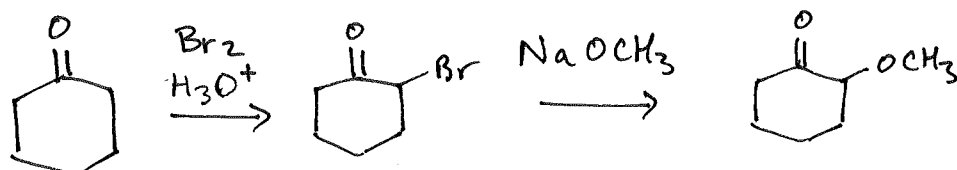
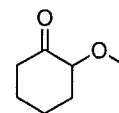


1.  $\text{Br}_2$ ,  $\text{PBr}_3$

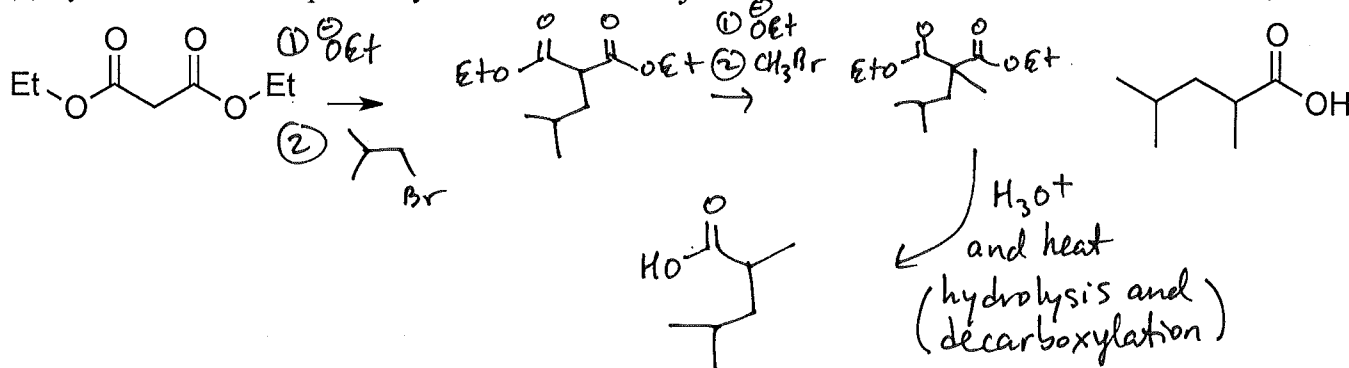
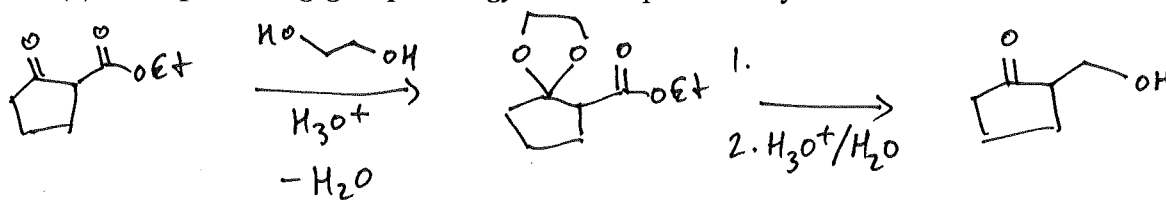
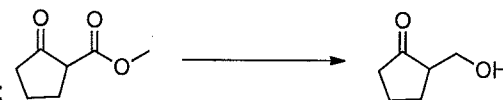
2.  $\text{H}_2\text{O}/\text{H}_3\text{O}^+$



204. Short syntheses.

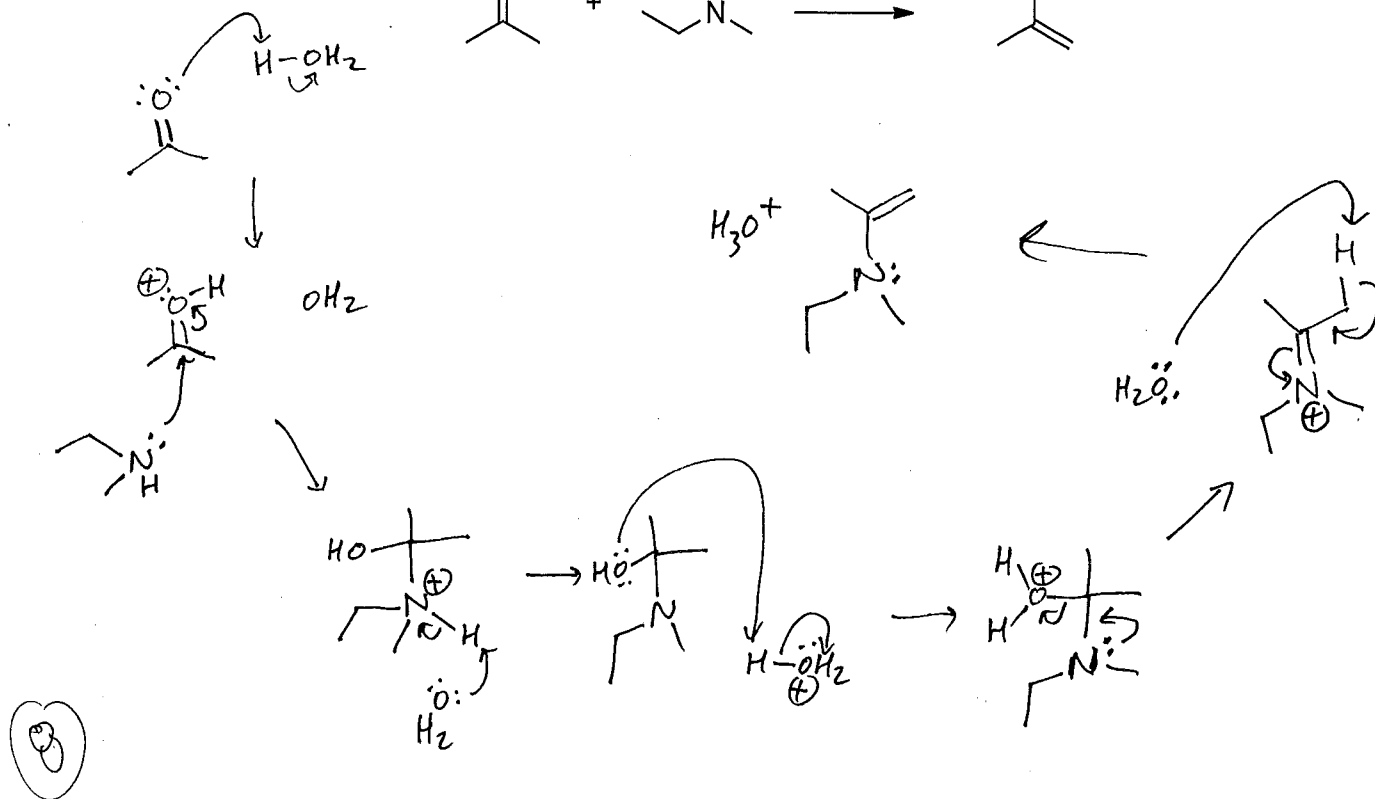
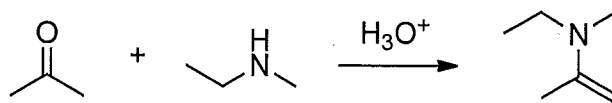
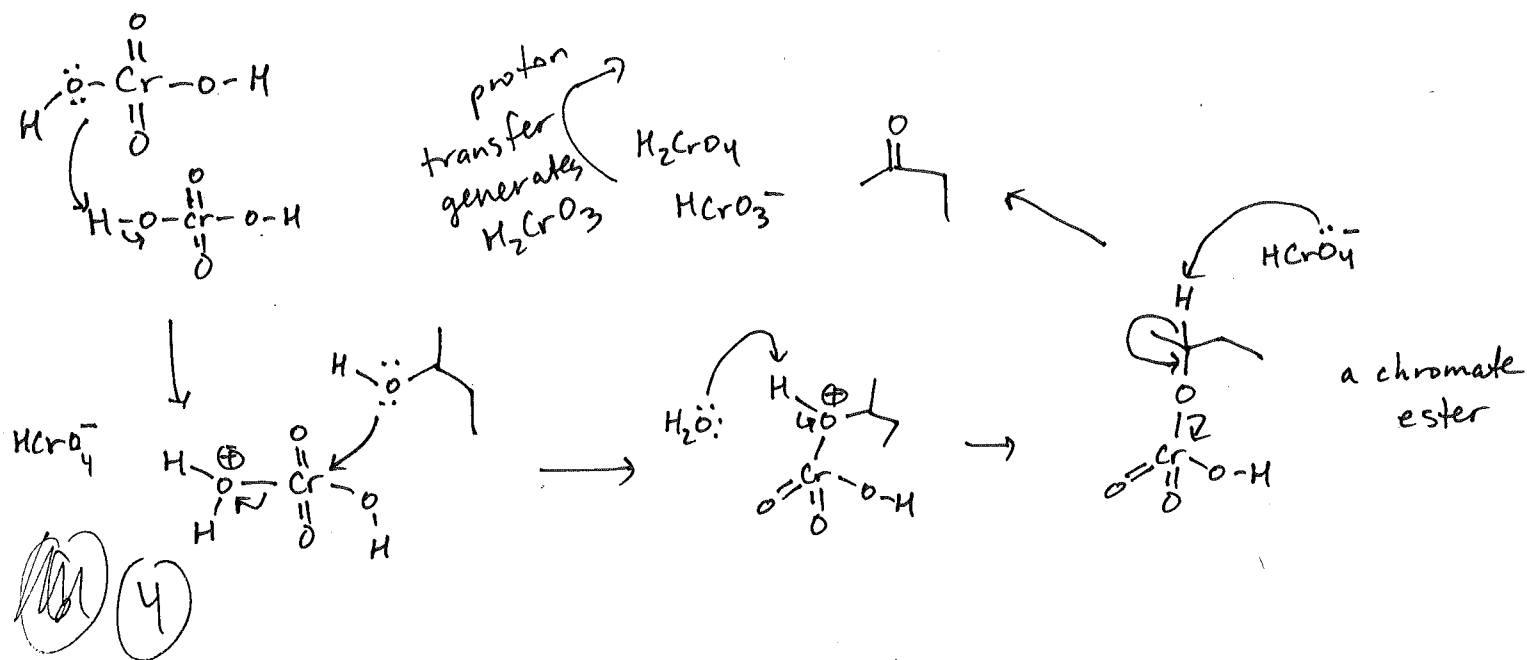
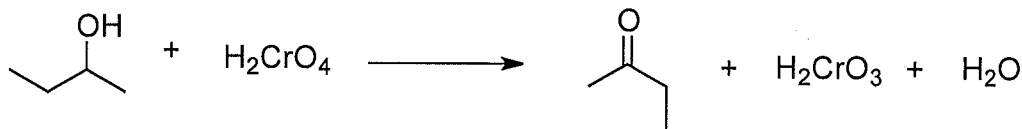
(a) Propose a synthesis of this compound from *cyclohexanone*.(b) Propose a synthesis of this compound from *cyclohexanone*.

(some elimination product will also be formed)

(c) Synthesize this compound by the *malonic ester synthesis*.(d) Use a *protecting-group strategy* to accomplish this synthesis:

completes workup (protonates alcohol)  
and it hydrolyzes the acetal

245. Please draw a stepwise electron pushing mechanism for the reactions shown below.



## Problem 5, continued.

