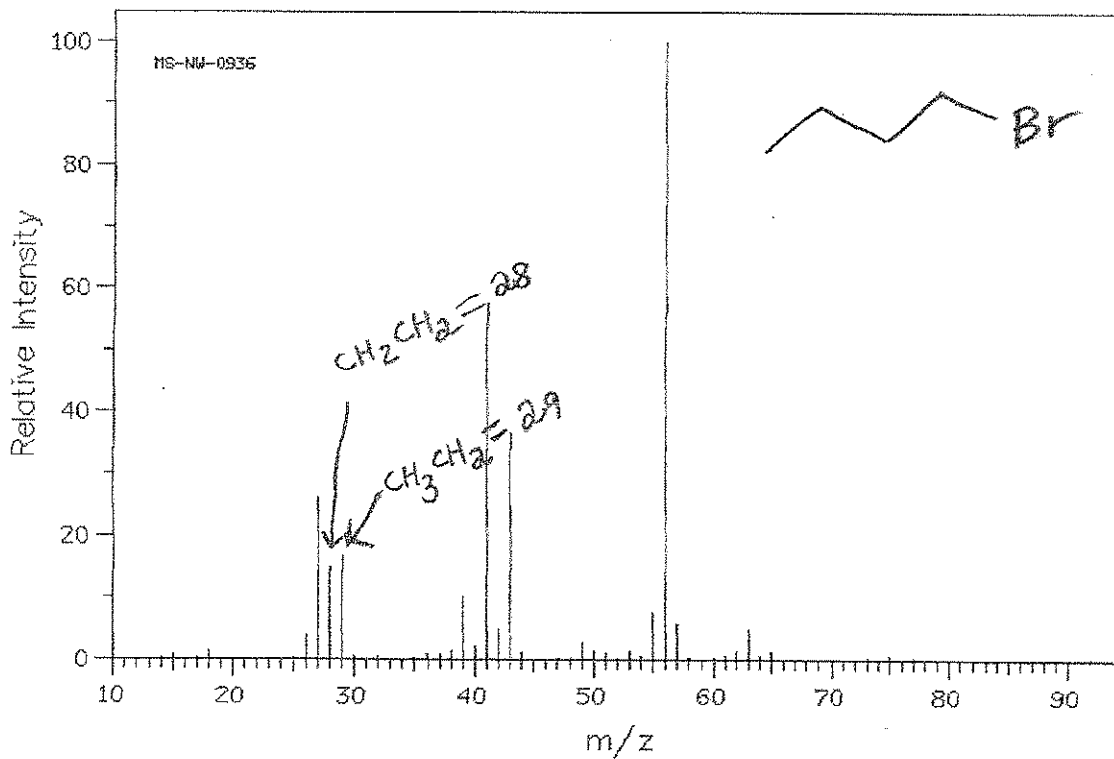
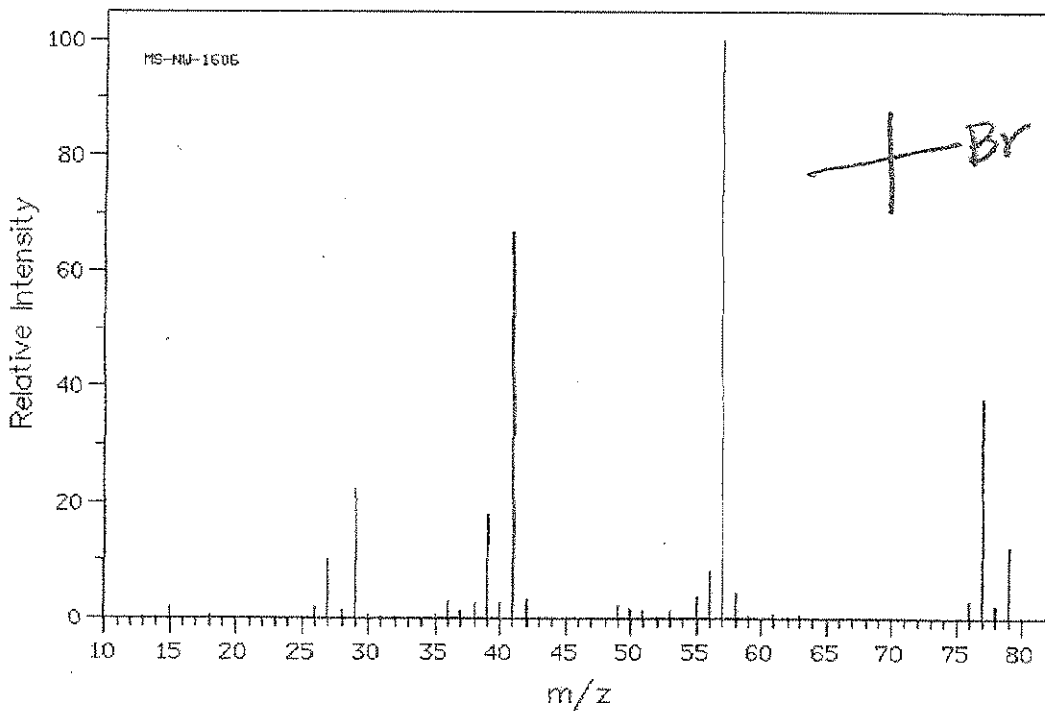


Answer key Spring'12

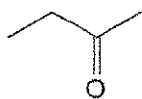
Final Exam

1. Below are the mass spectra of n-butylbromide  $\text{CH}_3\text{CH}_2\text{CH}_2\text{CH}_2\text{Br}$  and tertbutylbromide  $(\text{CH}_3)_3\text{CBr}$ . Label each spectrum to indicate which compound it matches up with. (4 points, 4 minutes).

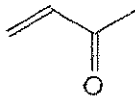
Ch 14



2. Below are the infrared spectra of 2-butanone and methylvinylketone. Label each spectrum to indicate which compound it matches up with. (4 points, 4 minutes).

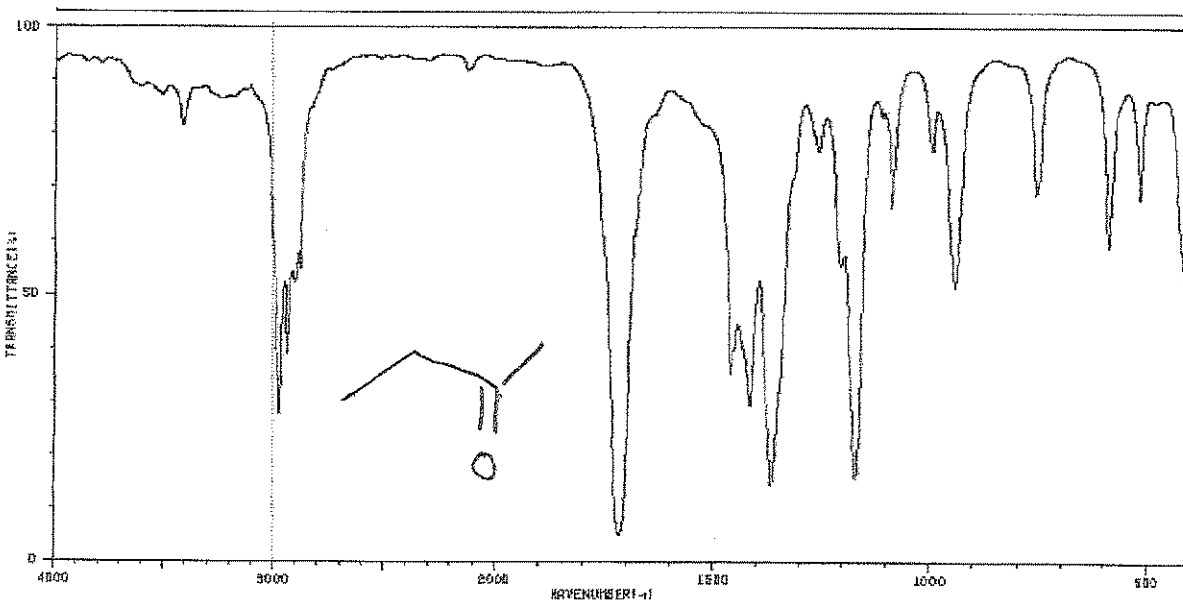
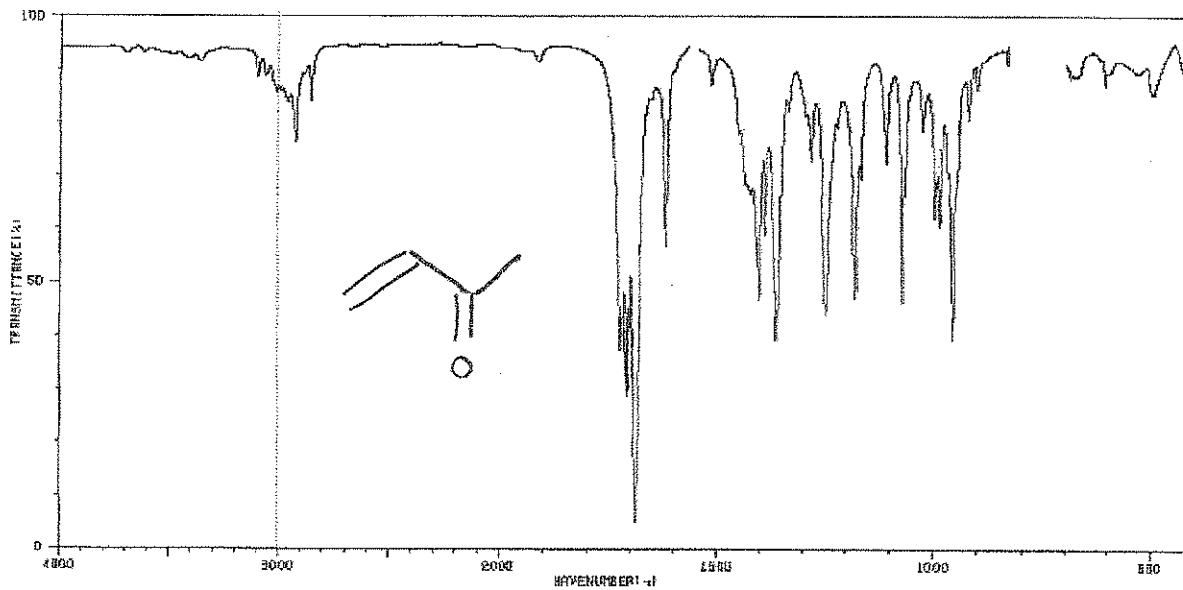


2-butanone



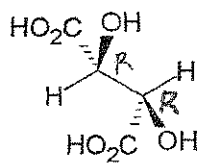
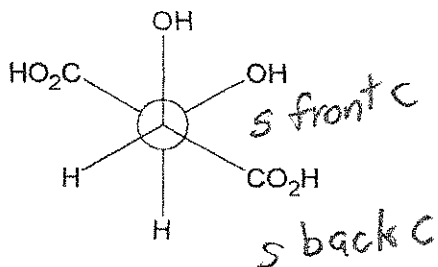
methylvinylketone

Ch. 12



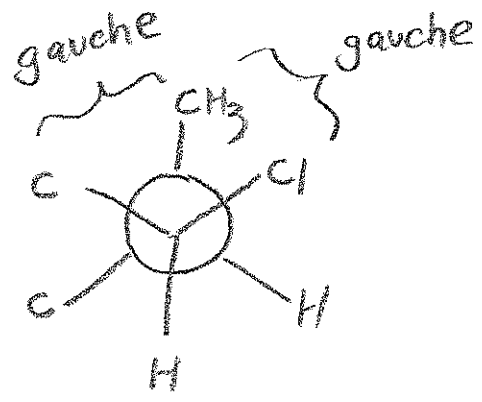
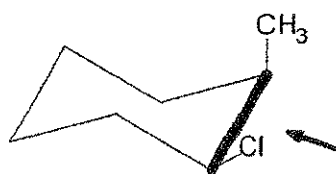
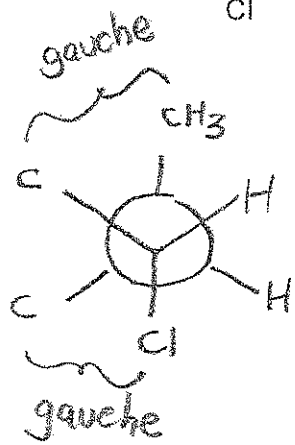
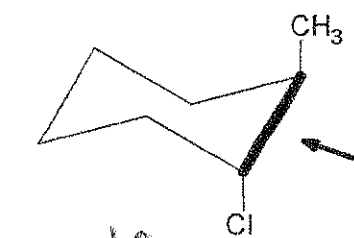
- 3a. Determine the R/S configuration for each of the chiral centers shown below. (8 pts, 10 min)  
 3b. What is the relationship between the two compounds (identical, enantiomers, diastereomers)?

Ch. 2/3



- 4a. For each of the two cyclohexane conformers shown below, draw a Newman projection along the C-C bond indicated. (8 points, 10 minutes)  
 4b. Label all gauche interactions present in your Newman projection.

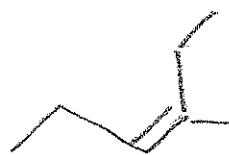
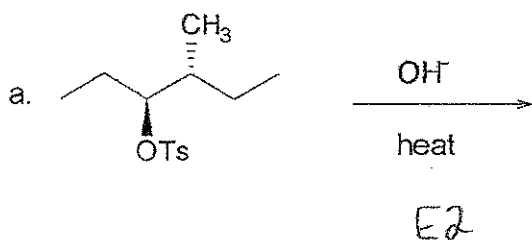
Ch. 2



(ring carbons are also <sup>always</sup> gauche) 5

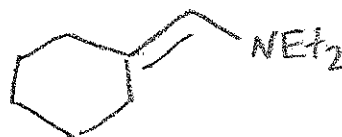
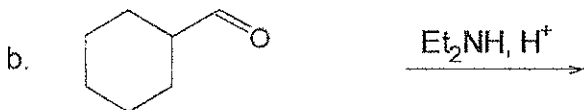
5. Show the **major** product or products of each of the following reactions. Do not show **minor** products. Be sure to show proper stereochemistry. (4 points each, 5 minutes each)

Ch. 9

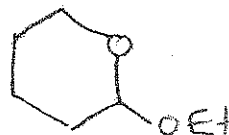
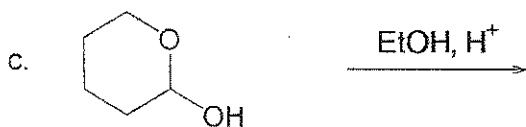


NOTE:  
-OTs is a good leaving group

OMIT  
Ch. 16



~~Ch. 16~~  
Ch. 9

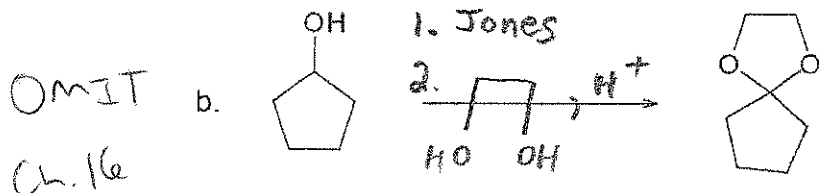


6. Give the reagent or reagents necessary to accomplish each of the following transformations. Number each step so it is clear when reagents must be added **together** or **separately**. Do not show **intermediates**. (4 points each, 5 minutes each)

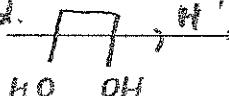


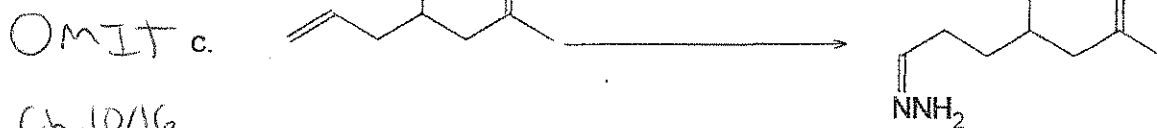
Ch. 11

- ↓ 1. Br, h $\nu$   
 2. KOH,  $\Delta$   
 3. MCPBA  
 4. OH<sup>-</sup>/H<sub>2</sub>O

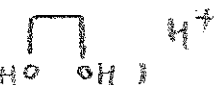


Ch. 16

1. Jones  
 2. , H<sup>+</sup>



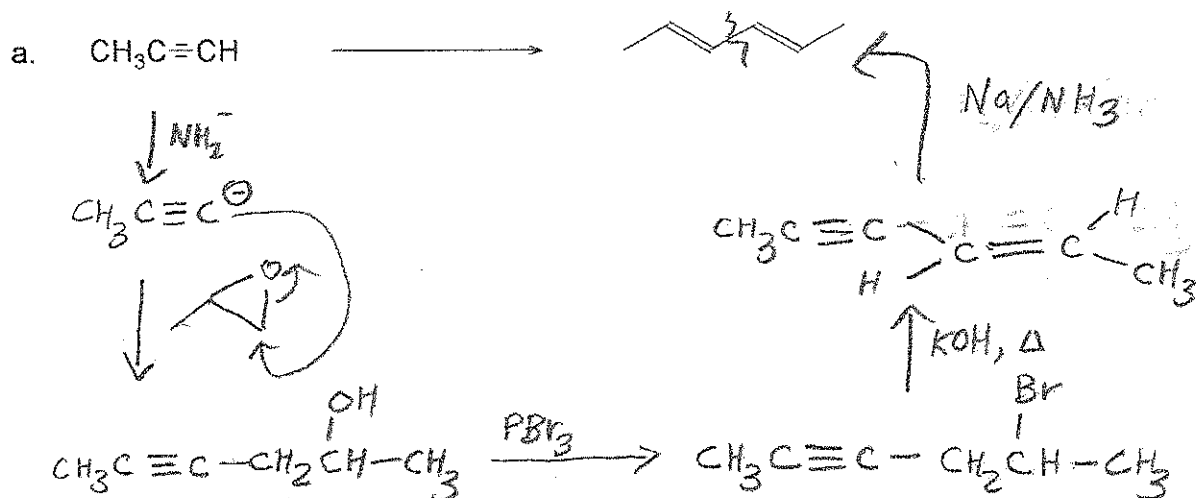
Ch. 10/16

1. , H<sup>+</sup>     4. PCC  
 2. TMSCl     5. H<sub>2</sub>NNH<sub>2</sub>, H<sup>+</sup>  
 3a. BH<sub>3</sub>     6. F<sup>-</sup> Bu<sub>4</sub>N<sup>+</sup>  
 3b. H<sub>2</sub>O<sub>2</sub>, OH<sup>-</sup>     7. H<sub>3</sub>O<sup>+</sup>

7. Give the reagent or reagents necessary to accomplish each of the following synthetic transformations. Any needed carbon based reagents are allowed. Show all intermediates. (6 points each, 7 minutes each)

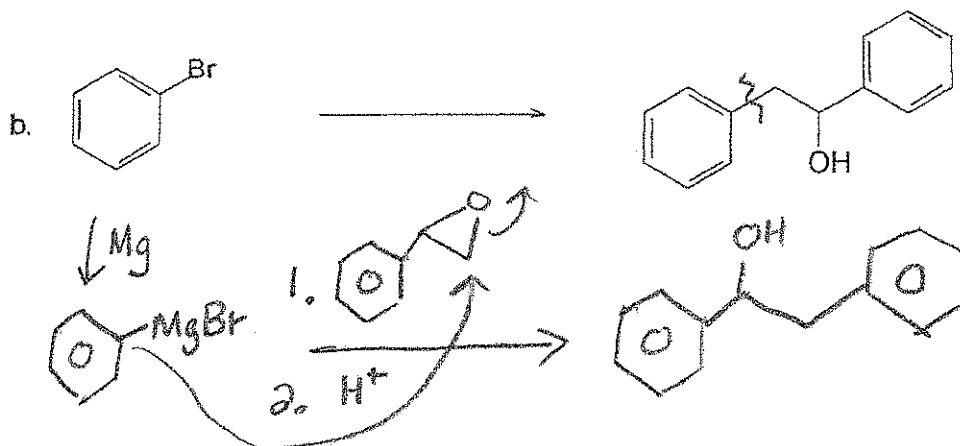
OMIT

Ch. 10/11



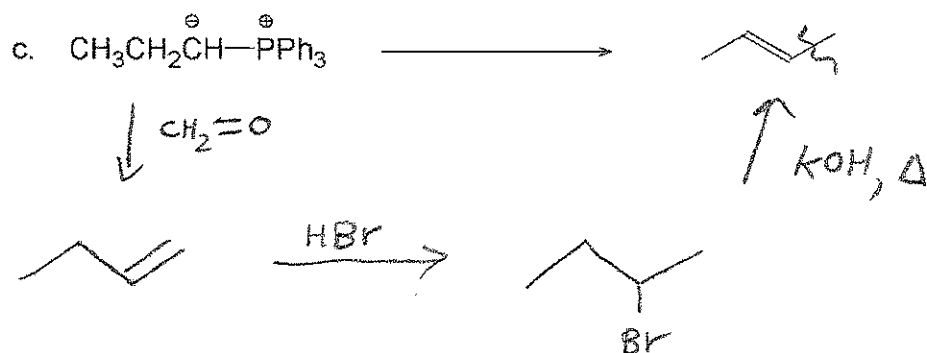
OMIT

Ch. 11



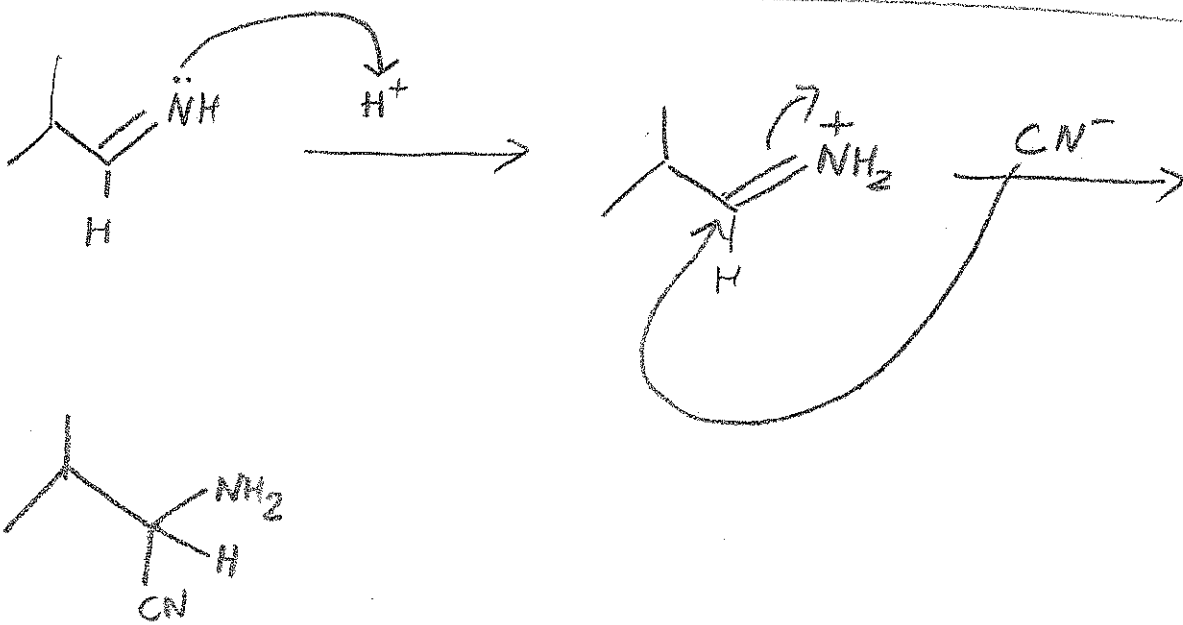
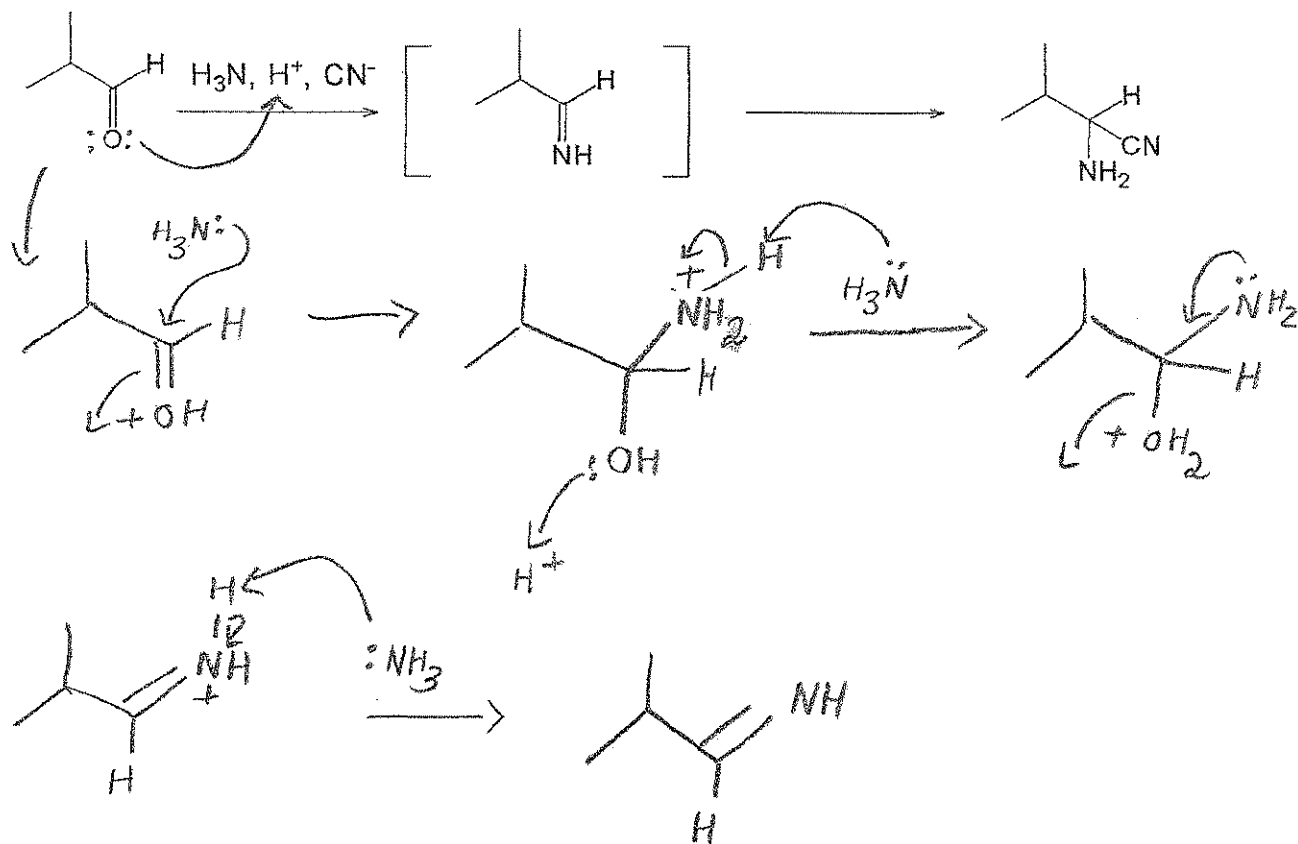
OMIT

Ch. 16

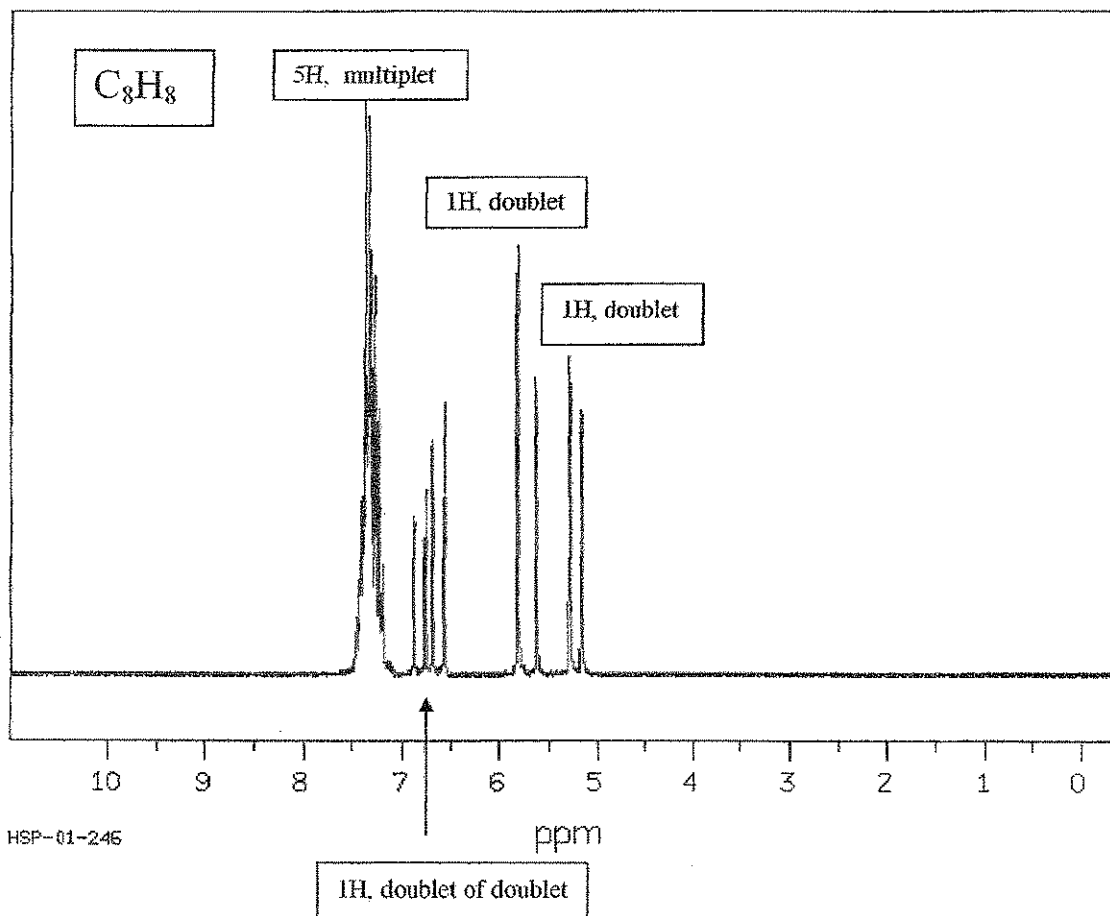


8. Show the mechanism for *both* steps of the following reaction. (18 points, 22 minutes)

OMIT  
Ch. 16



9. Determine the structure of the compound whose  $^1\text{H}$  NMR spectrum is shown below. You must show your work in order to receive credit for your answer. (8 points, 10 minutes)





10. Determine the structure of the compound whose  $^1\text{H}$  NMR spectrum is shown below. You must show your work in order to receive credit for your answer. (8 points, 10 minutes)

Ch.B

