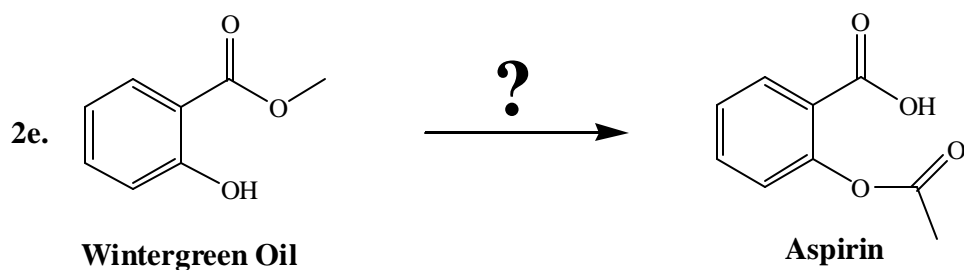
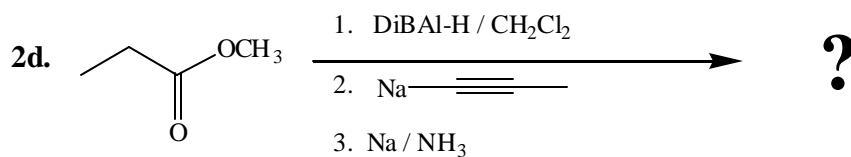
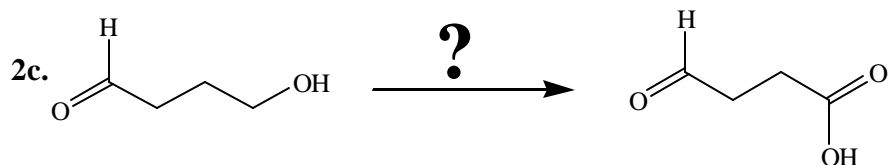
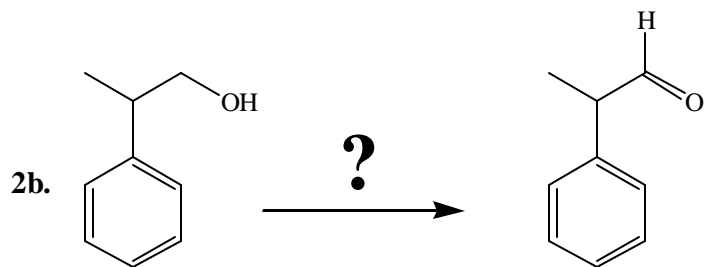
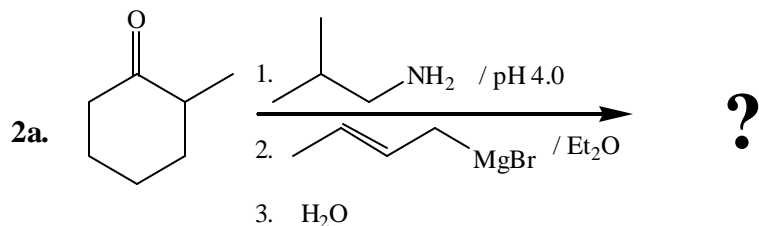
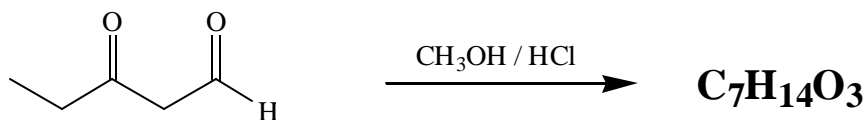




2. Fill in the Blank. Provide reagents or the major product for the following reactions as determined by the question mark (?). More than one reagent may be necessary. Provide the major product formed in the reactions. Be sure to show your work as partial credit will be given. DO NOT WRITE MECHANISMS AS PART OF YOUR ANSWER (50 points).



3. Consider the following reaction and experimental data: (25 points)

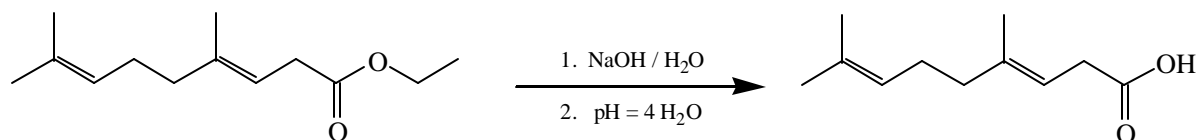


NMR Data			IR Data	
Chemical Shift ( $\delta$ )	Coupling	Integration (cm)	Wavenumber (cm <sup>-1</sup> )	Intensity
1.05	Triplet	8.25	2945 - 2850	Medium
2.19	Quartet	5.70	1715	Strong
2.75	Doublet	5.65	1343	Medium
3.38	Singlet	16.09	1140	Strong
4.89	Triplet	2.73		

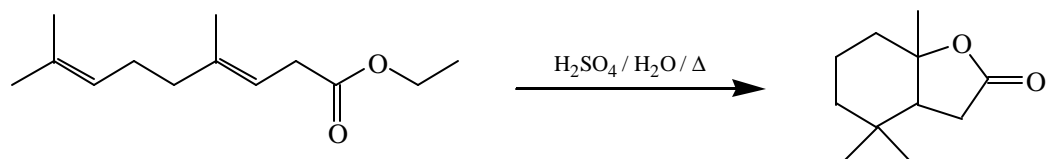
- 3a. Specify the identity of the “four things” for each appropriate atom in this reaction?
- 3b. What is the product?
- 3c. What is a mechanism that accounts for the formation of your predicted product?
- 3d. Explain why the product is formed in the absence of any other possible products.

4. Bob and Jane were going to work together on an organic chemistry experiment. However, they could not decide on the reaction conditions to use to hydrolyze their ester (Compound A). Jane decided to do the reaction under basic conditions and Bob decided to use acidic. Their results are as follows: (35 Points)

### Jane's Reaction



### Bob's Reaction



- 4a. What is the mechanism for the formation of Jane's product?

4b. What is the mechanism for the formation of Bob's Product?

4c. Besides the fact that Bob got the wrong product, why else is Jane's reaction better?