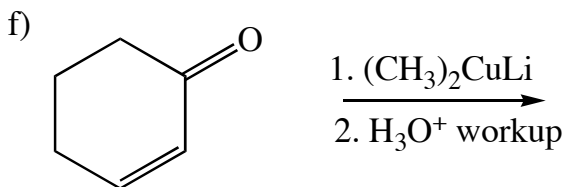
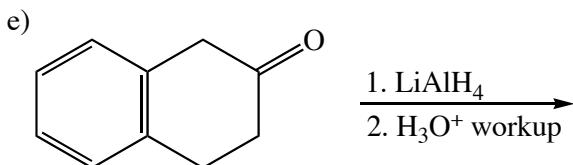
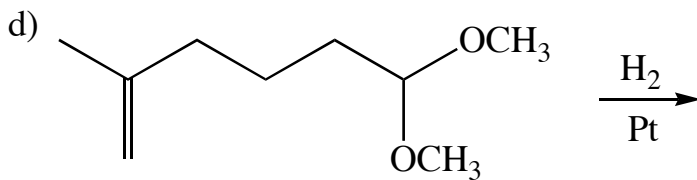
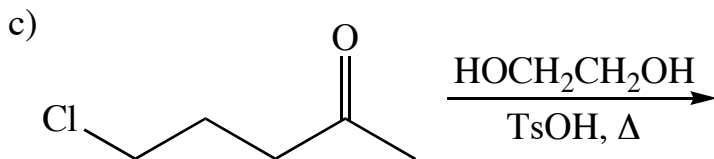
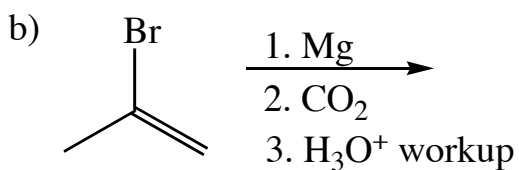
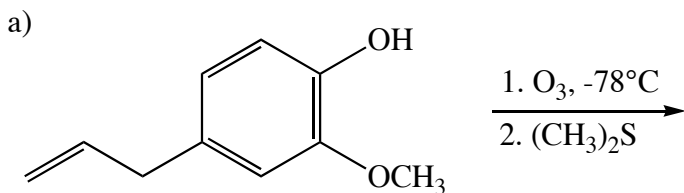


**Chemistry 250 -- Exam #4 -- December 9, 2008**

There are 6 pages.

1. (24 pts) Complete the following reactions. Show the stereochemistry of the products where appropriate. Label major and minor products where appropriate. (They all react!)

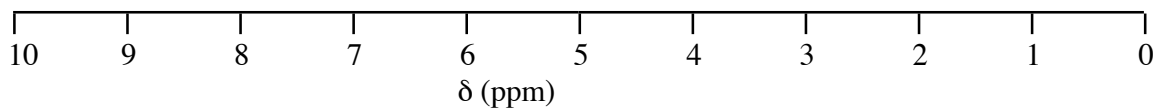
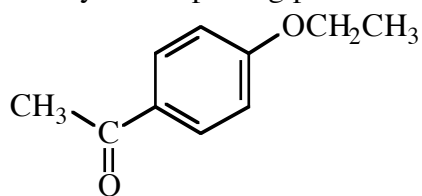




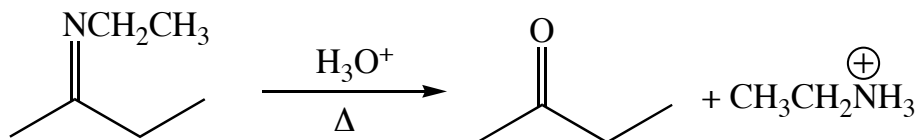
Name: \_\_\_\_\_

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4. (9 pts) Sketch an approximate  $^1\text{H-NMR}$  spectrum for the compound shown below. Clearly show splitting patterns and indicate which protons go to which peaks in the NMR.



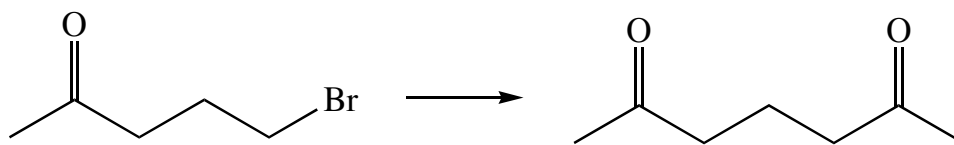
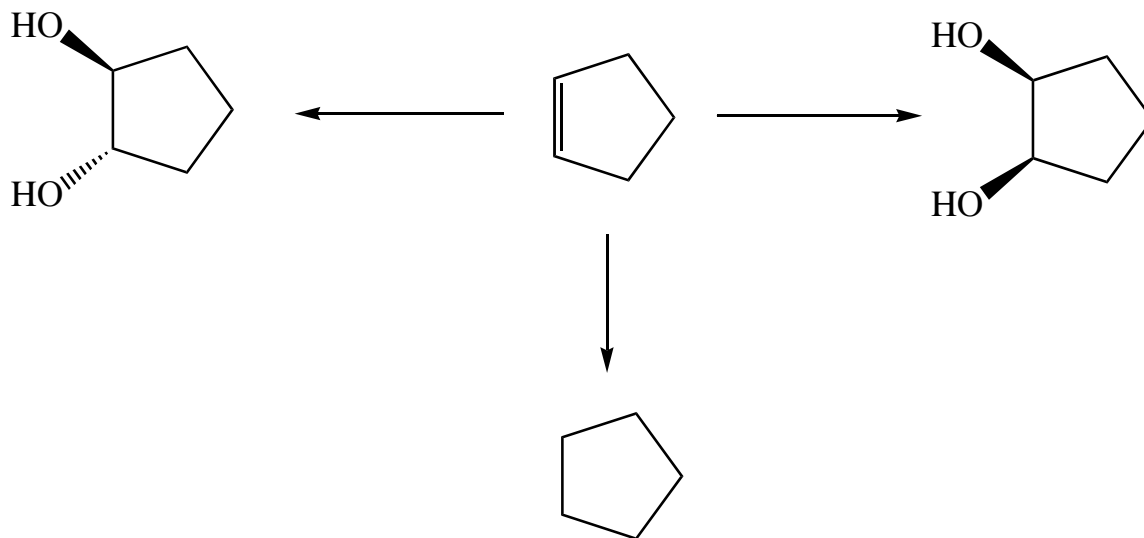
6. (10 pts) Draw a detailed mechanism (using curved arrows) for the reaction shown below.



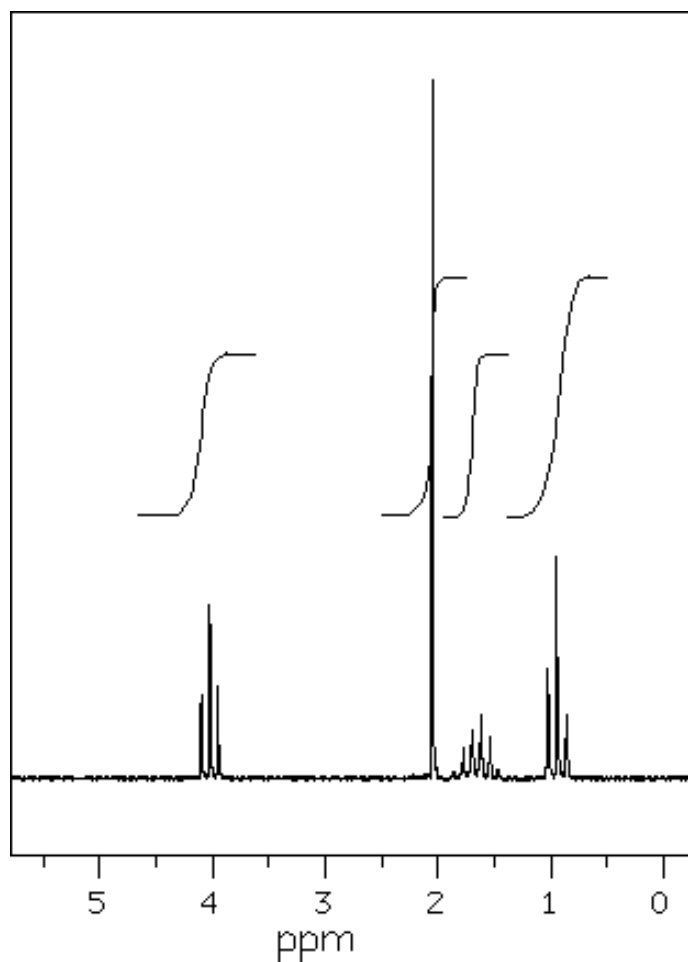
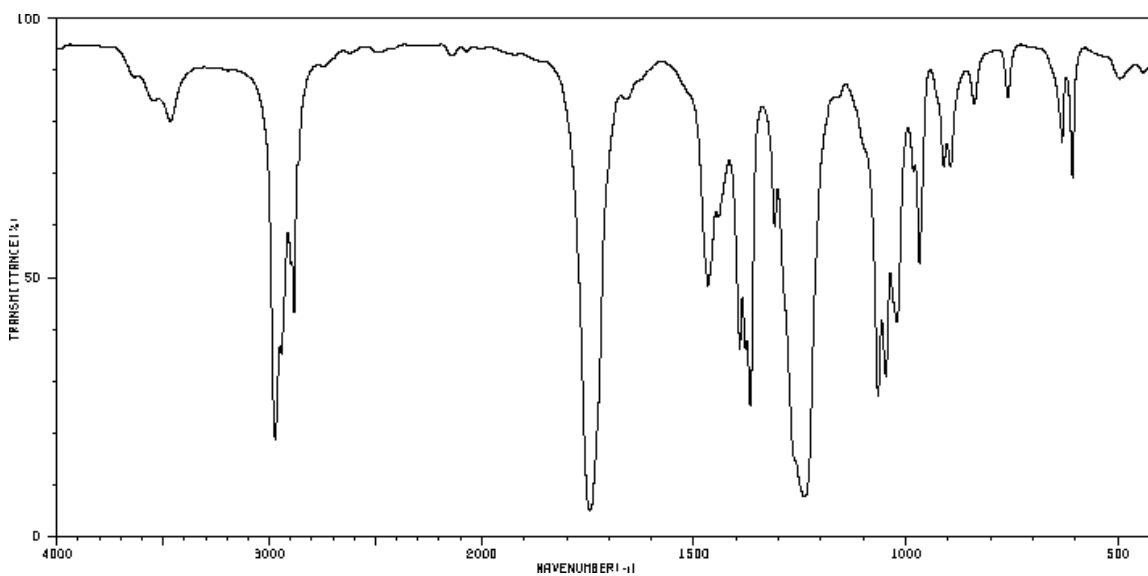
Name: \_\_\_\_\_

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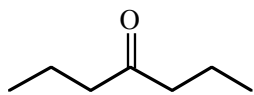
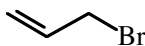
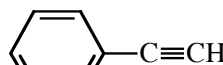
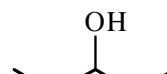
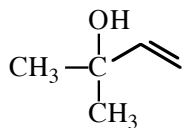
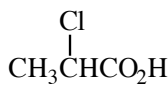
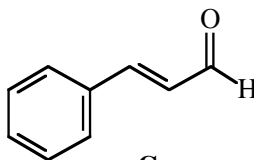
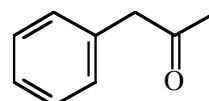
8. (18 pts) List the reagents necessary to accomplish the following transformations. You may use any two carbon molecules as well as standard organic (or inorganic) reagents.



8. (9 pts) An unknown with the molecular formula  $C_5H_{10}O_2$  gave the following IR and  $^1H$ -NMR spectra. Determine the structure and indicate which peaks are associated with which protons in the NMR spectrum. Also identify the important IR absorptions.



9. (9 pts) Indicate which of the following compounds correspond to each of the IR spectra shown below. *To receive full credit you must indicate the characteristic absorptions in each of the spectra.*

**A****B****C****D****E****F****G****H**