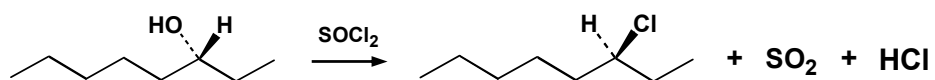


Problem Set #2 [Chapters 17, 18, and 19 (up to Section 19.3 inclusive)]

1) Consider the following reaction:



a) Provide the IUPAC name for the starting material in the reaction.

\_\_\_\_\_

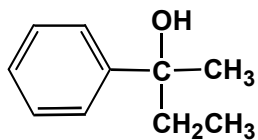
b) Conversion of the alcohol into an alkyl chloride by reaction with  $\text{SOCl}_2$  is an example of an:

- i) E1 process
- ii)  $\text{SN}_1$  process
- iii) E2 process
- iv)  $\text{SN}_2$  process?

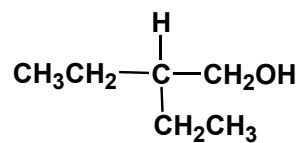
c) Write the complete stepwise mechanism for the reaction showing all intermediates.

2) Show what Grignard reagent and what carbonyl compound you would start with to prepare the alcohols given below. Give all possibilities.

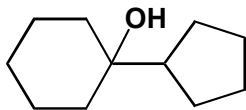
a)



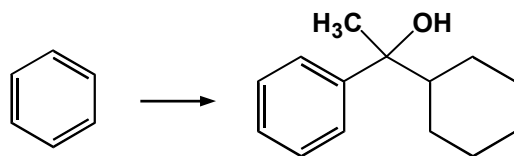
b)



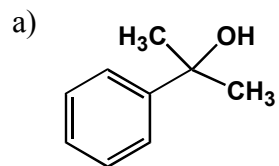
c)



3) Outline the synthetic steps necessary to carry out the conversion below. You may use any organic or inorganic reagents that are required. Show structures of all intermediate compounds that would be isolated during the course of the synthesis, and show all reagents.



4) Draw structures or give IUPAC names for each of the following:



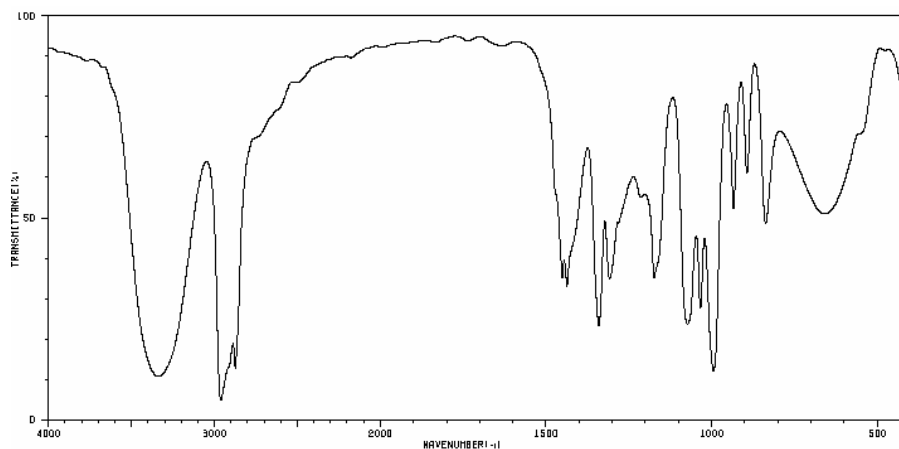
b) 2-methyl-2-butanol

c) cyclobutanone

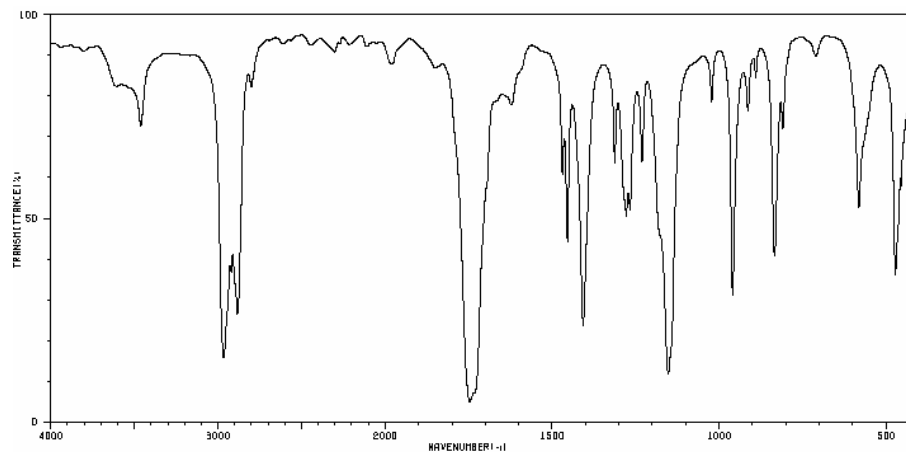
d) 9-crown-3

- 5) Compound A of molecular formula  $C_5H_{10}O$  may be oxidized to Compound B of molecular formula  $C_5H_8O$  with  $Na_2Cr_2O_7$  in aqueous acetic acid. The infrared spectra of Compound A and Compound B are given below. Neither A nor B reacts with bromine in carbon tetrachloride or with dilute potassium permanganate solution. Assign possible structures for the compounds (**Note:** despite the fact that the right-hand-side of each spectrum is cut-off  $\ominus$ , the information that you need to answer the question is provided).

Compound A



Compound B



6) Propose a synthesis of 1,4-dioxane, starting from 1,2-dibromoethane as the source of carbon.

