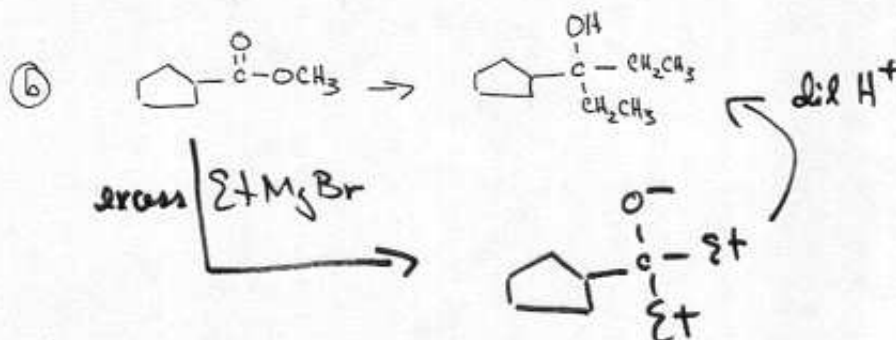
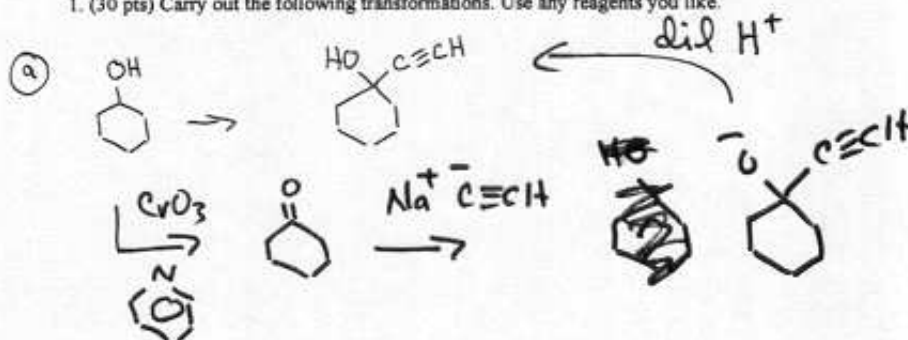


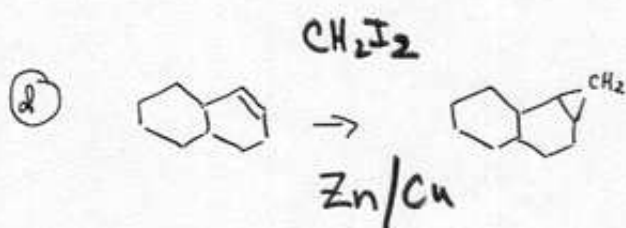
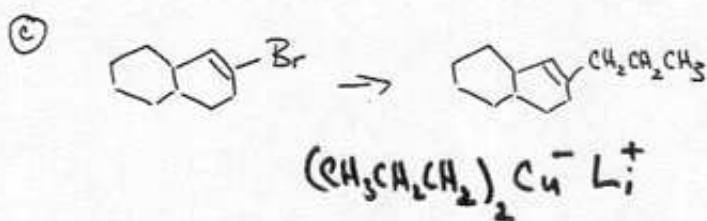
Name: Key (please print)

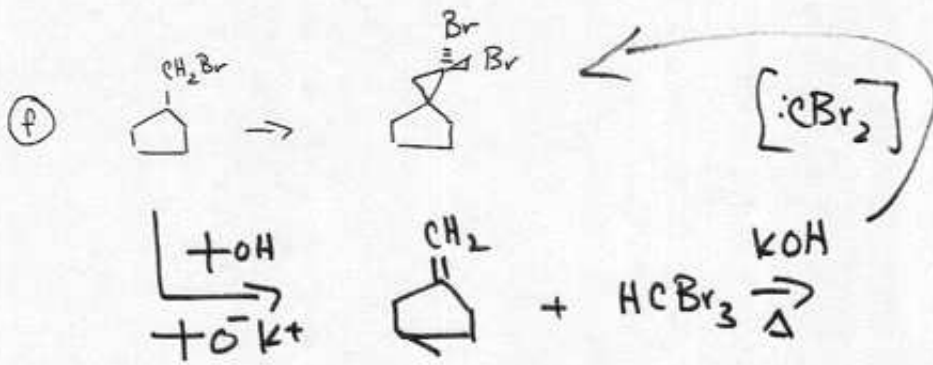
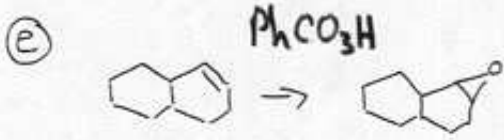
1. (30 pts) Carry out the following transformations. Use any reagents you like.



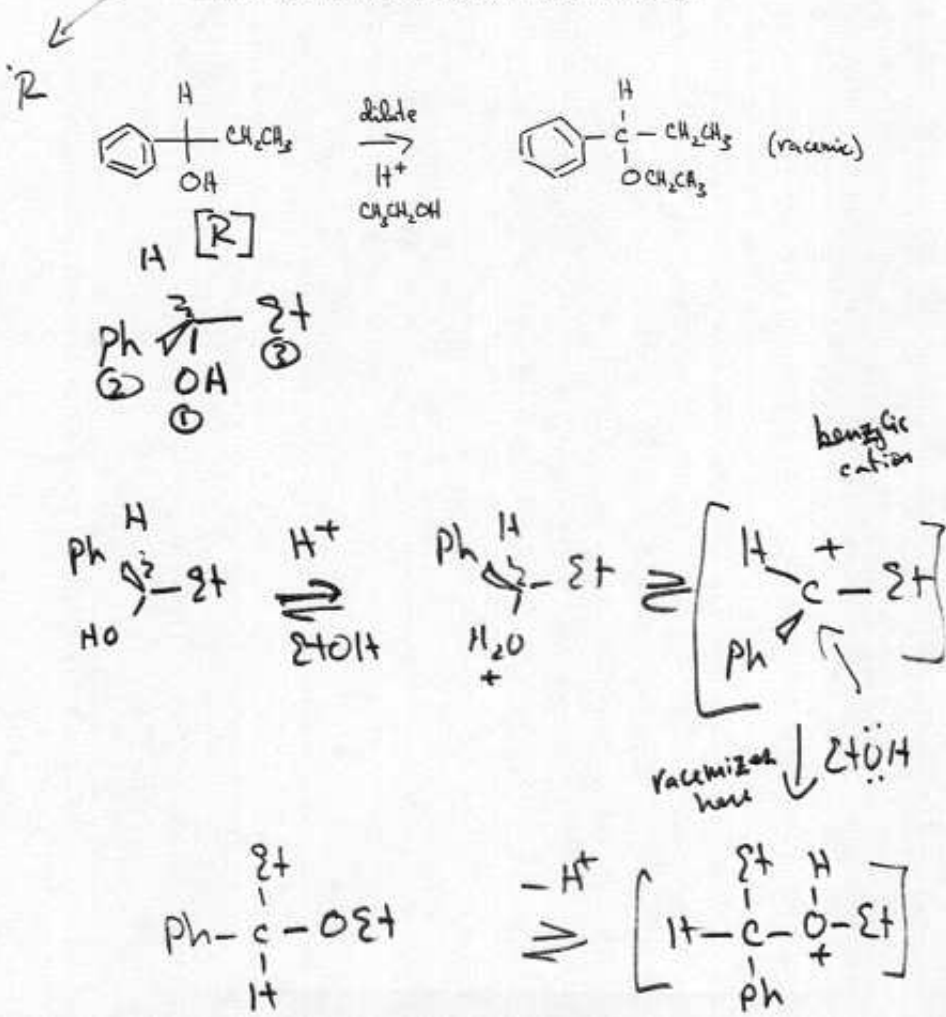
- 2 -

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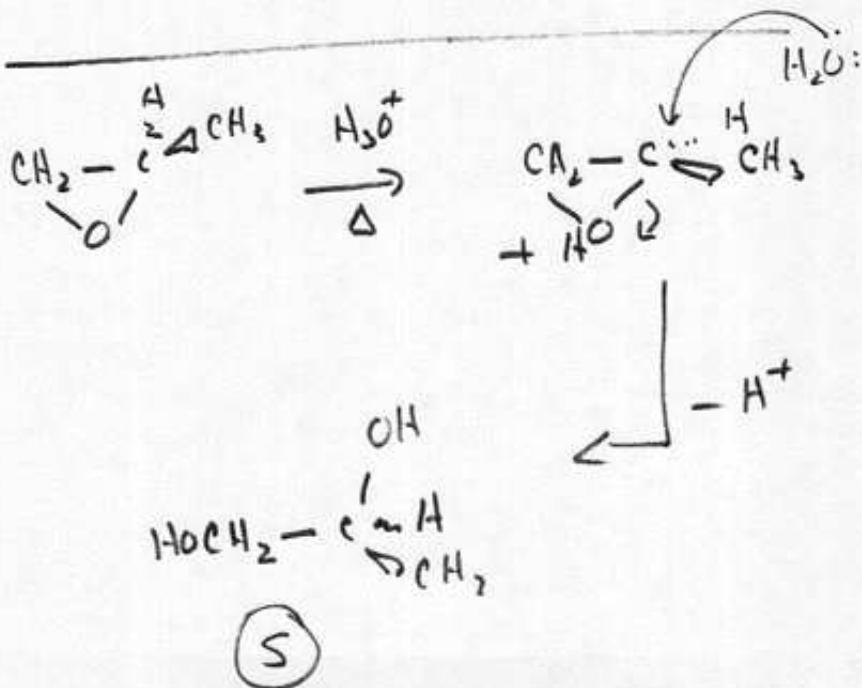
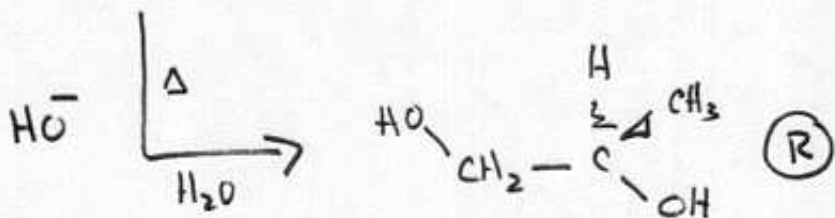
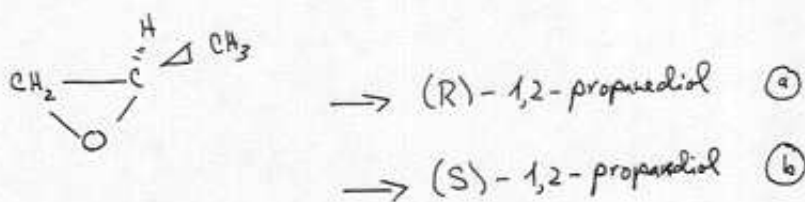




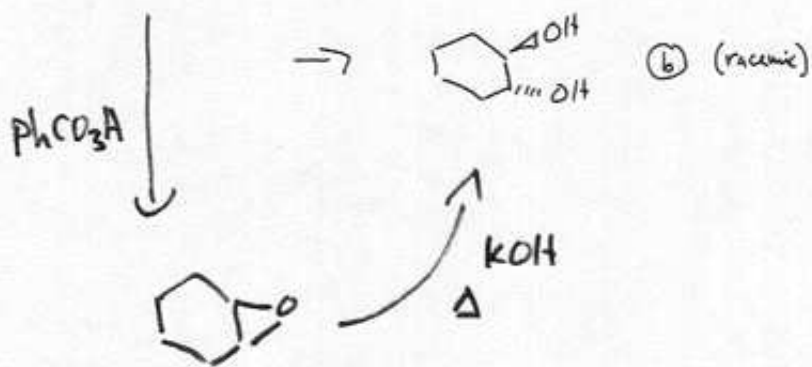
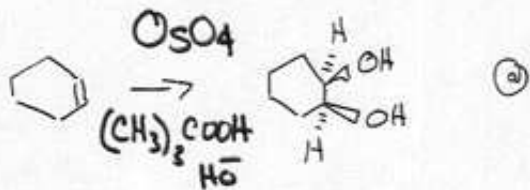
2. (10 pts) Optically active 1-phenyl-1-propanol is converted into a racemic mixture of 1-phenyl-1-propyl-ethyl ether by treatment with dilute acid in ethanol solution. a) What is the configuration about the chiral center in the starting 1-phenyl-1-propanol (which I have drawn as a Fischer projection)? b) What is the mechanism of this reaction?



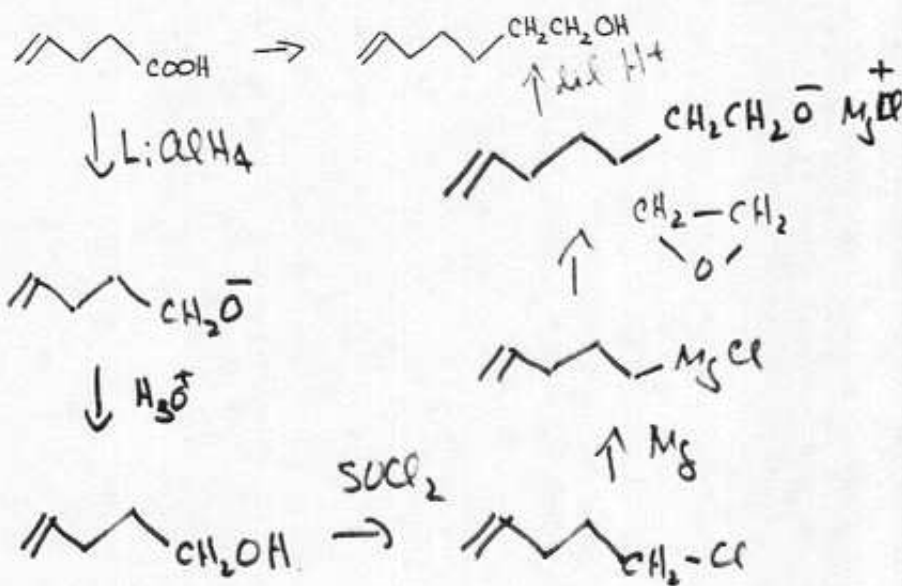
3. (10 pts) Carry out the following transformation. Use any reagents you like.



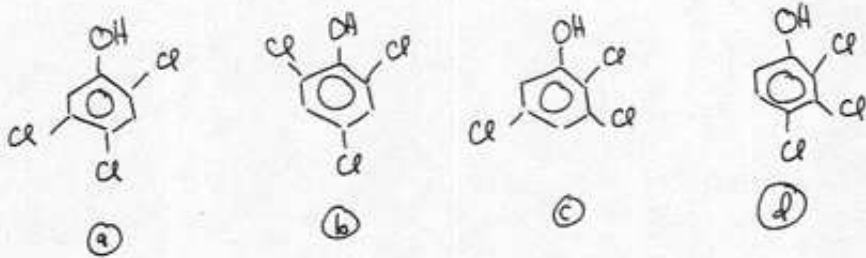
4. (10 pts) Carry out the following transformation. Use any reagents you like.

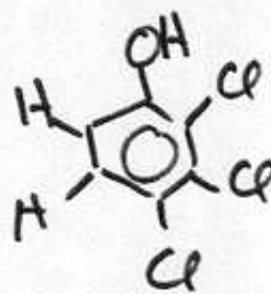
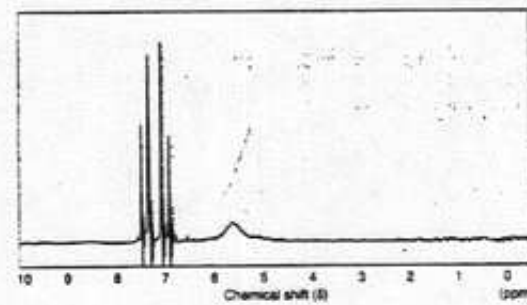
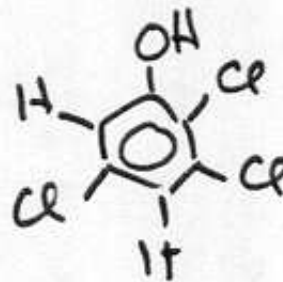
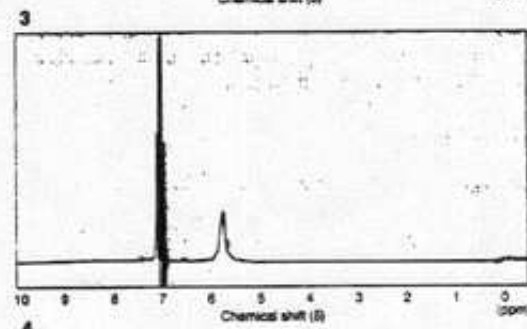
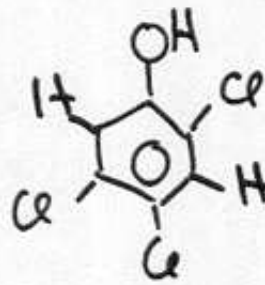
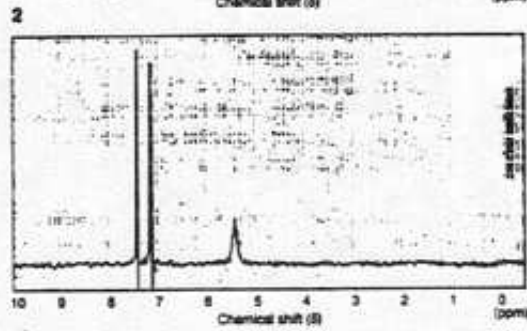
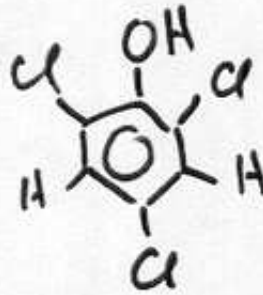
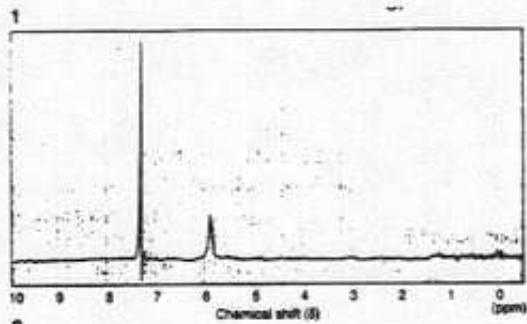


5. (10 pts) Carry out the following transformation. Use any reagents you like.

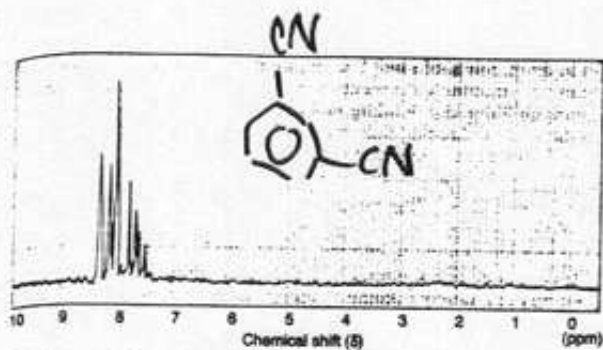


6. (15 pts) Assign the following ^1H nmr spectra to the isomers of trichlorophenol shown below and explain your reasoning.





7. (15 pts) Which of the molecules give rise to which spectra?



*PROBLEM 15.12 (CONTINUED)

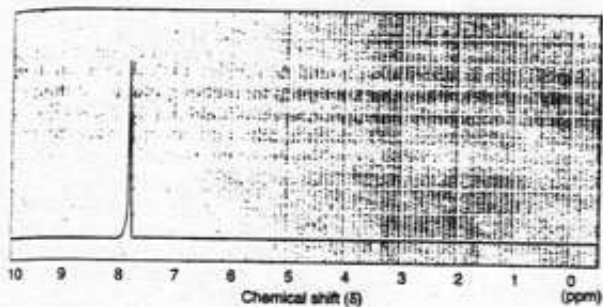
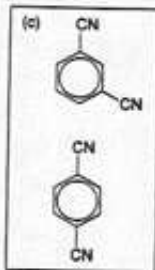


FIGURE 15.32 (CONTINUED)

PROBLEM 15.12 Which of the molecules in Figure 15.32 give rise to which spectra?

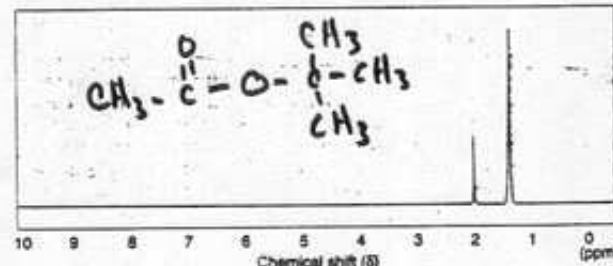
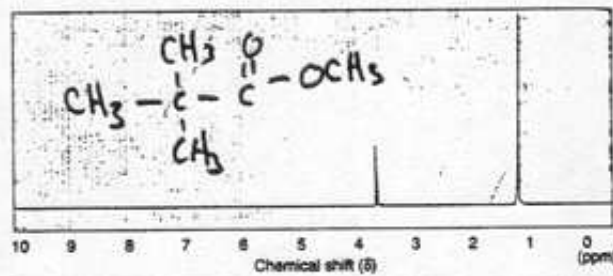
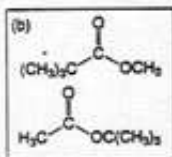
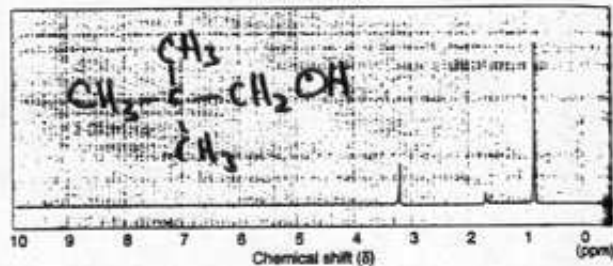
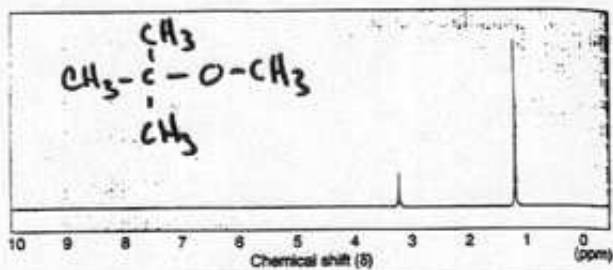
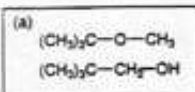


FIGURE 15.32