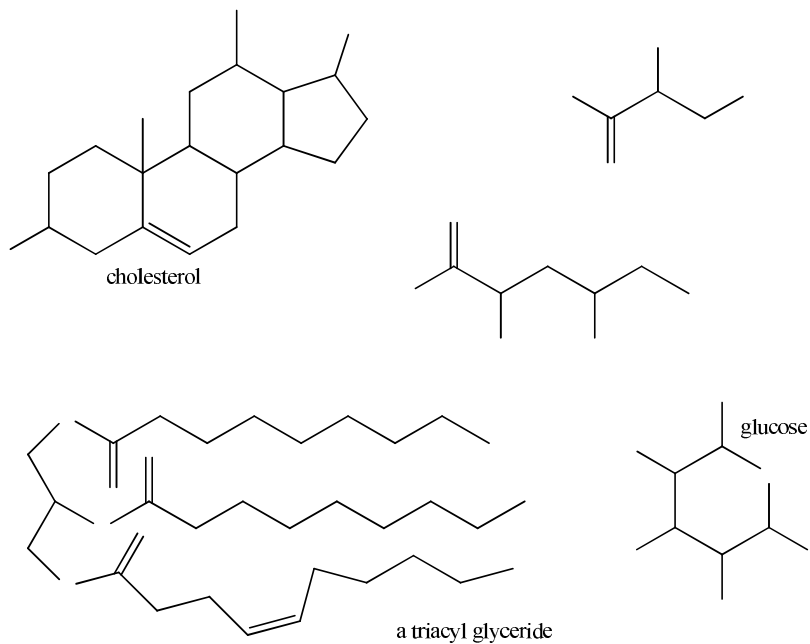
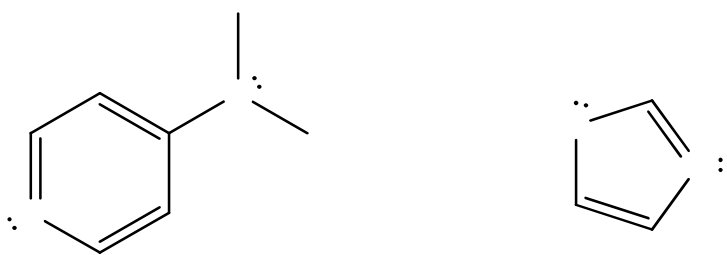


Practice Exam 2: R340

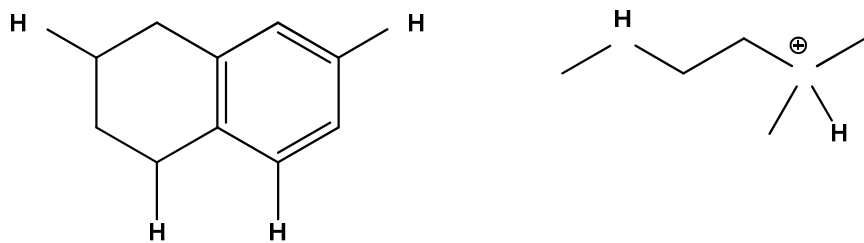
1. (5pts) Would you expect these molecules to be water soluble or water insoluble?



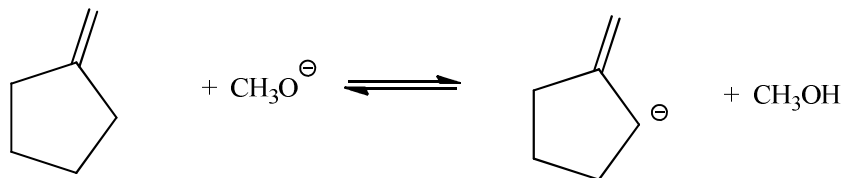
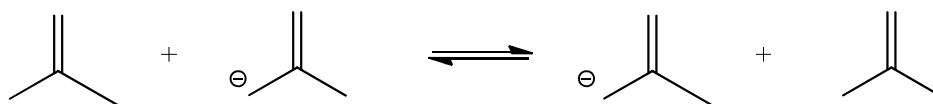
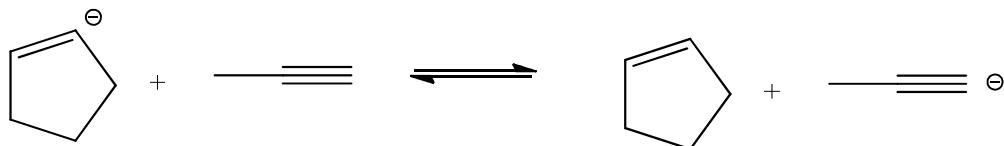
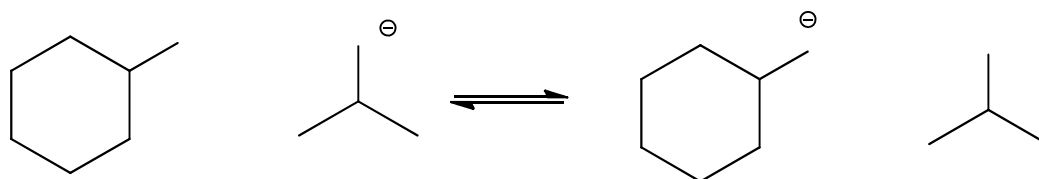
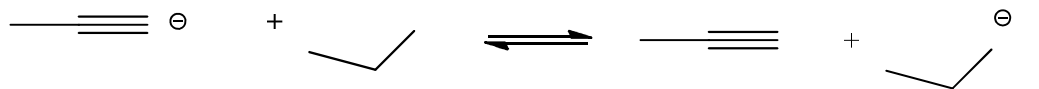
2. (6pts) Which lone pair in these molecules is protonated with a strong acid? Be sure to consider their “real” electron distribution with concepts of resonance, induction, hybridization, delocalization, and aromaticity.



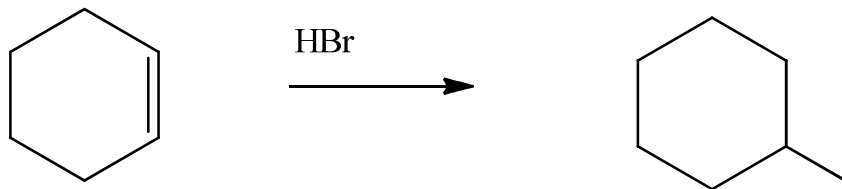
3. (10pts) List pKa values for 6 of the bold protons. Which of these four compounds is the most acidic? Which is least acidic? Explain.



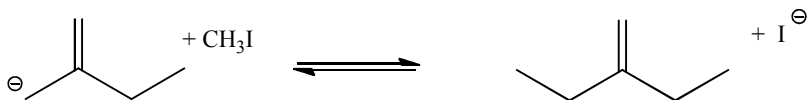
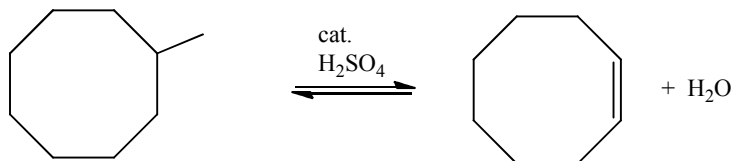
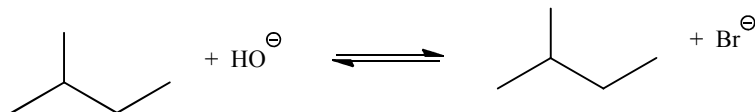
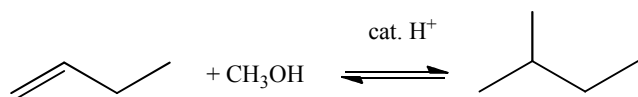
4. (10pts) Circle the WEAKER BASE in each reaction. What base stability principle did you use?



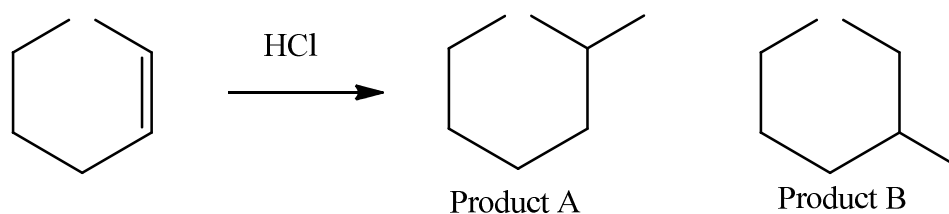
5. (16pts) Draw an arrow mechanism for the reaction, then draw an energy diagram with correct relative energies. Label the energy diagram as endothermic or exothermic.



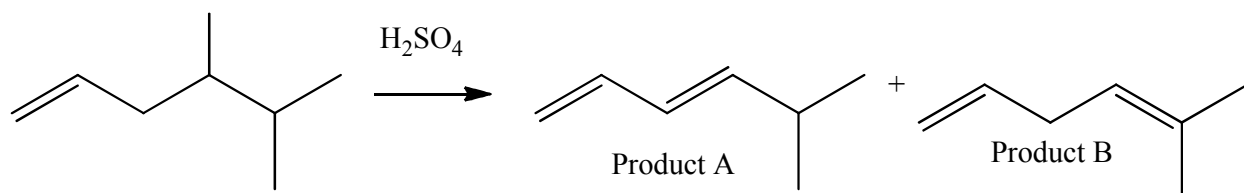
6. (10pts) Label each reaction as an electrophilic addition, elimination, or nucleophilic substitution. Are these reactions favorable or unfavorable?



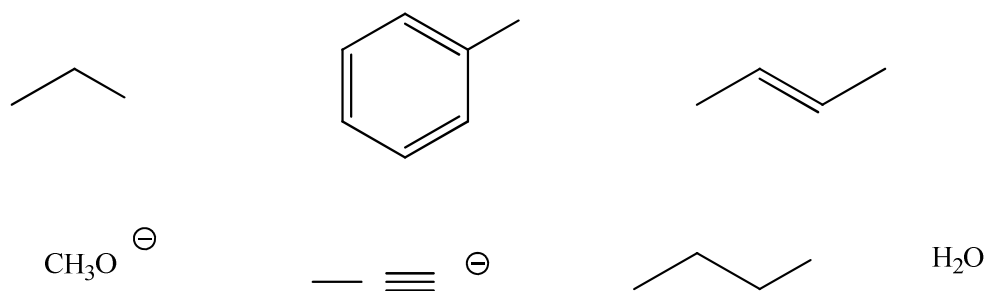
7. (12pts) Which product is the major product of this reaction, product A or B? Use a mechanism to explain.



Which product is the major product of this reaction, product A or B? Why?



8. (7pts) Which of the following would be considered strong nucleophiles for a substitution reaction? Which are weak nucleophiles?



9. (12pts) Match the reasons that the reaction doesn't occur as written with the appropriate reaction. One will be left blank.

_____ The product is not the most stable alkene that could form.

_____ The leaving group is not stable enough.

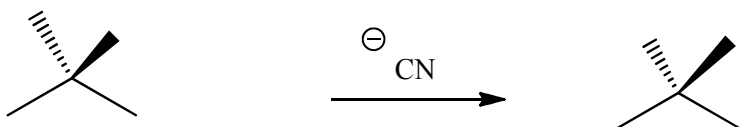
_____ The wrong stereochemistry is drawn for the product.

_____ The nucleophile is not strong enough

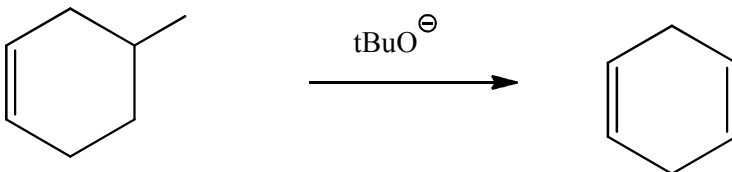
_____ The electrophile is too sterically hindered.

_____ The equilibrium lies to the left due to Le Chatlier's principle.

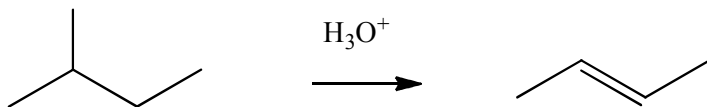
A.



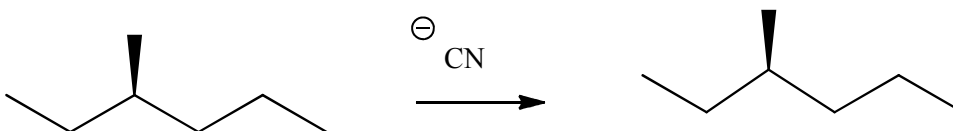
B.



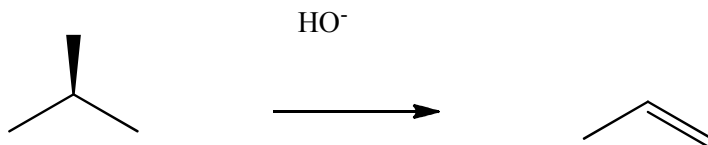
C.



D.



E.



10. (15pts) Fill in the missing starting material, product, or reagent in each of these reaction.

