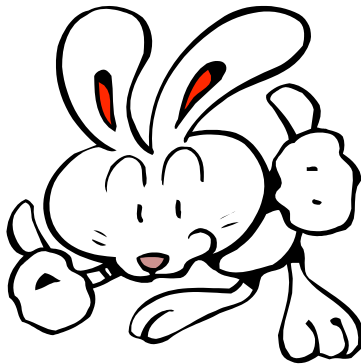
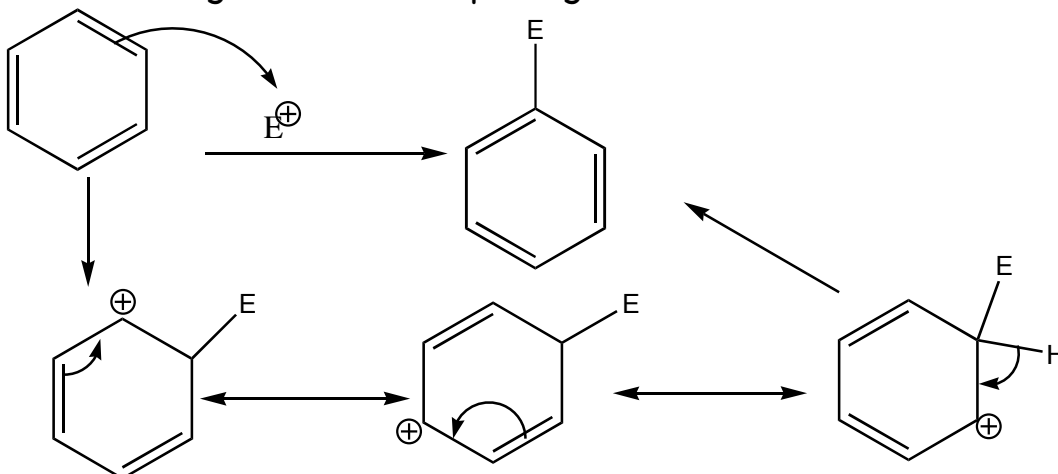


Exam II
SI Review
Answer Key

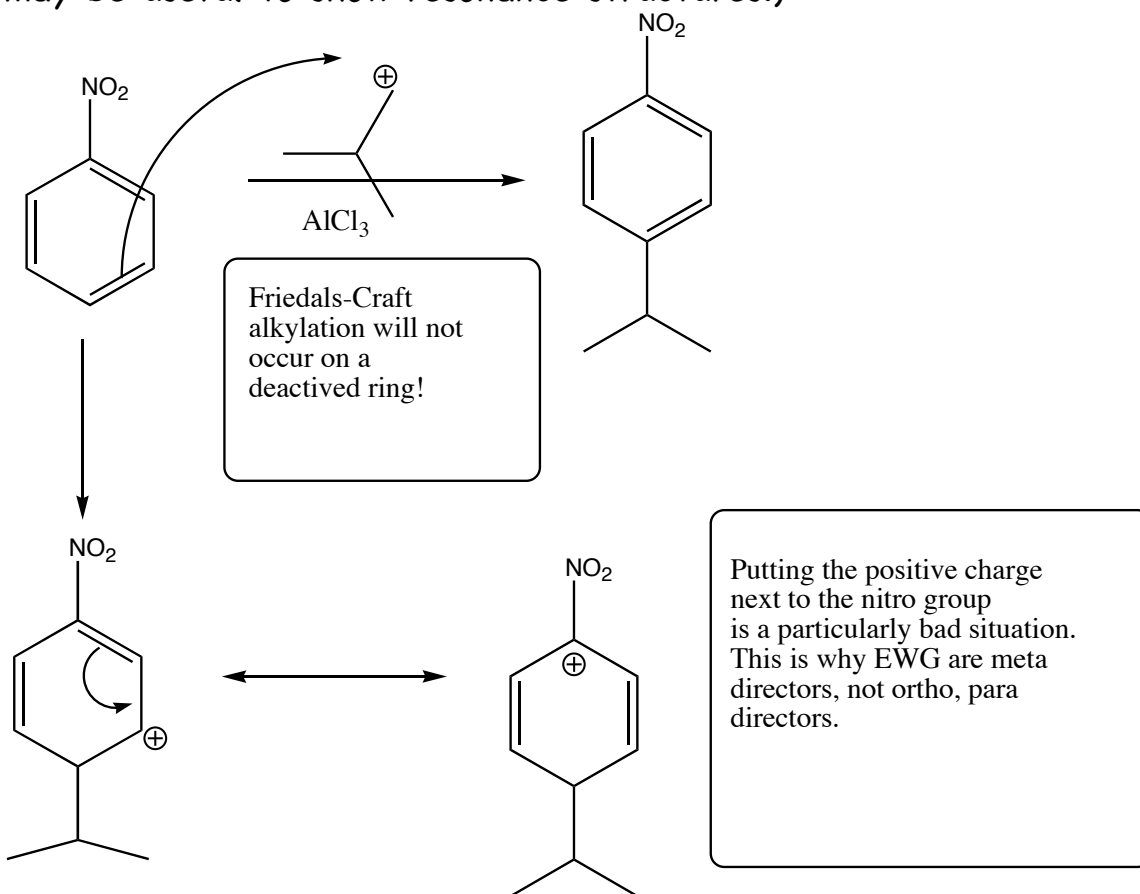
*It is strongly recommended that you complete the practice exam before viewing the answers. This review only includes material up through 03/01/04 lecture. *



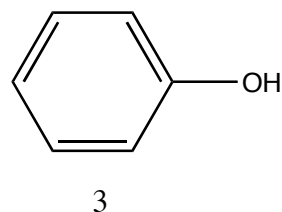
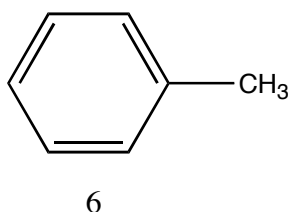
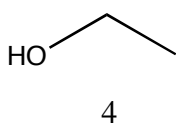
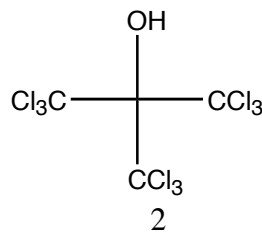
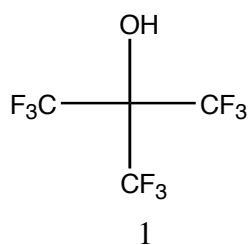
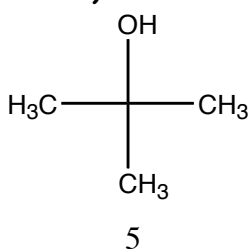
1.) Electrophilic Aromatic Substitution Mechanism: Please fill in the following structures depicting the correct mechanism.



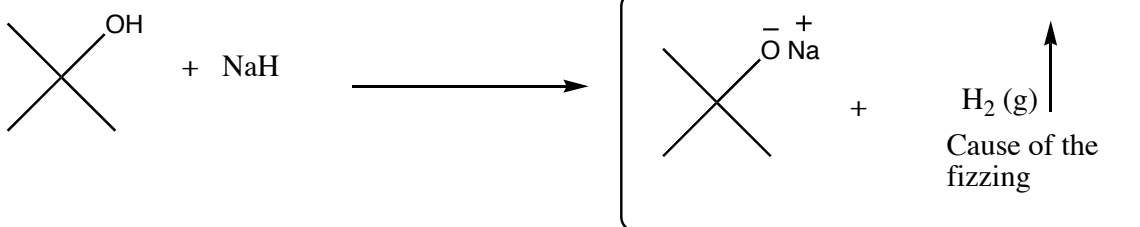
2.) Why will the following reaction not occur as written? (Hint: it may be useful to show resonance structures.)



3.) Rank the following alcohols from highest K_a value to lowest K_a value (1 being the highest K_a value and 6 being the lowest K_a value)

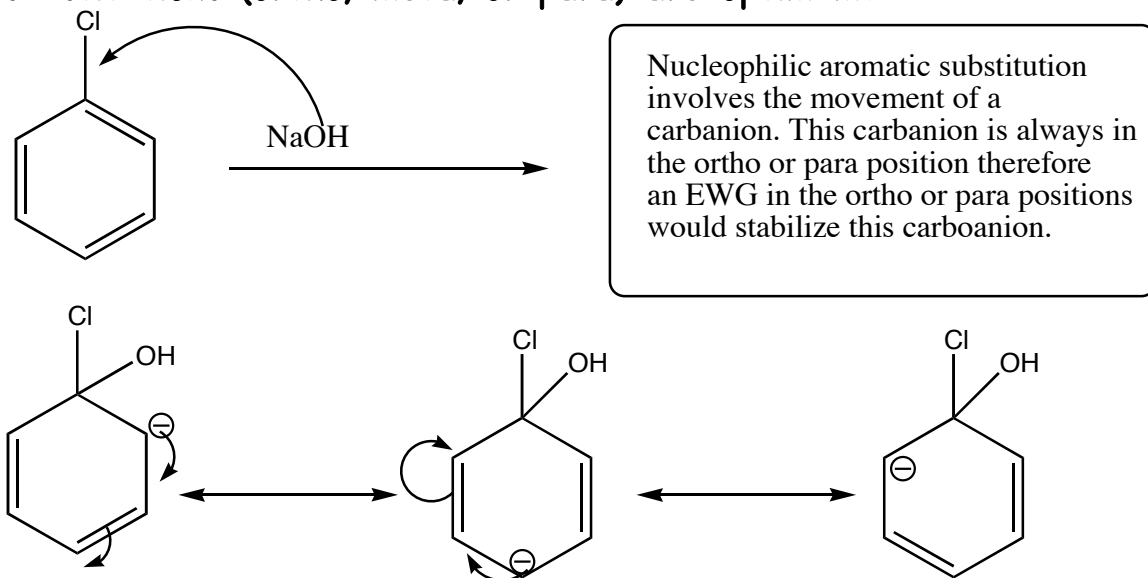


5.) Your laboratory TA has asked the class to make *t*-butyl alkoxide using sodium hydride (see below reaction). She cautions you to keep the reaction away from all flames. As the reaction progresses you notice a fizzing sound. **What is causing this fizzing sound? Is this reaction reversible?**

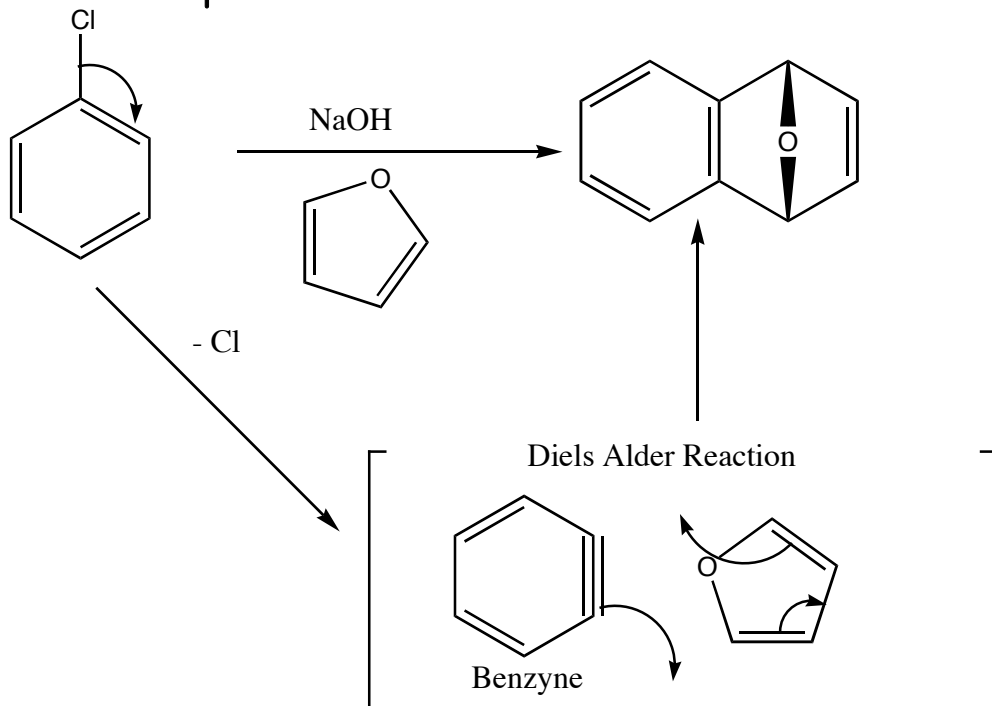


The reaction is irreversible because of the escaping byproduct $\text{H}_2(\text{g})$.

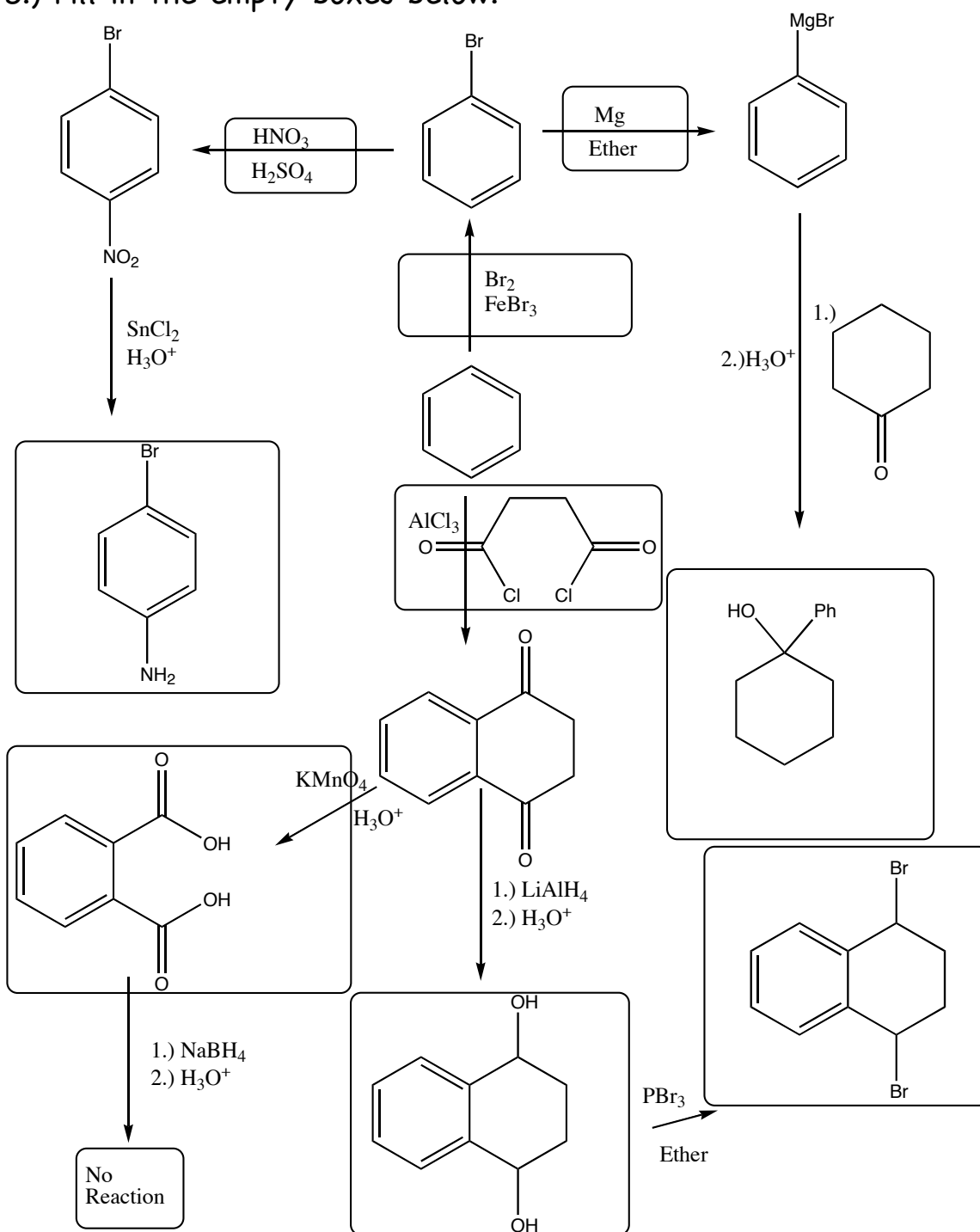
6.) When attempting to conduct a nucleophilic aromatic substitution of chlorobenzene (see reaction below) you notice that adding electron-withdrawing groups increases the rate of reaction and decreases temperature at which the reaction needs to be ran. Explain why adding EWG benefit the reaction and what substitutions (ortho, meta, or para) are optimum?



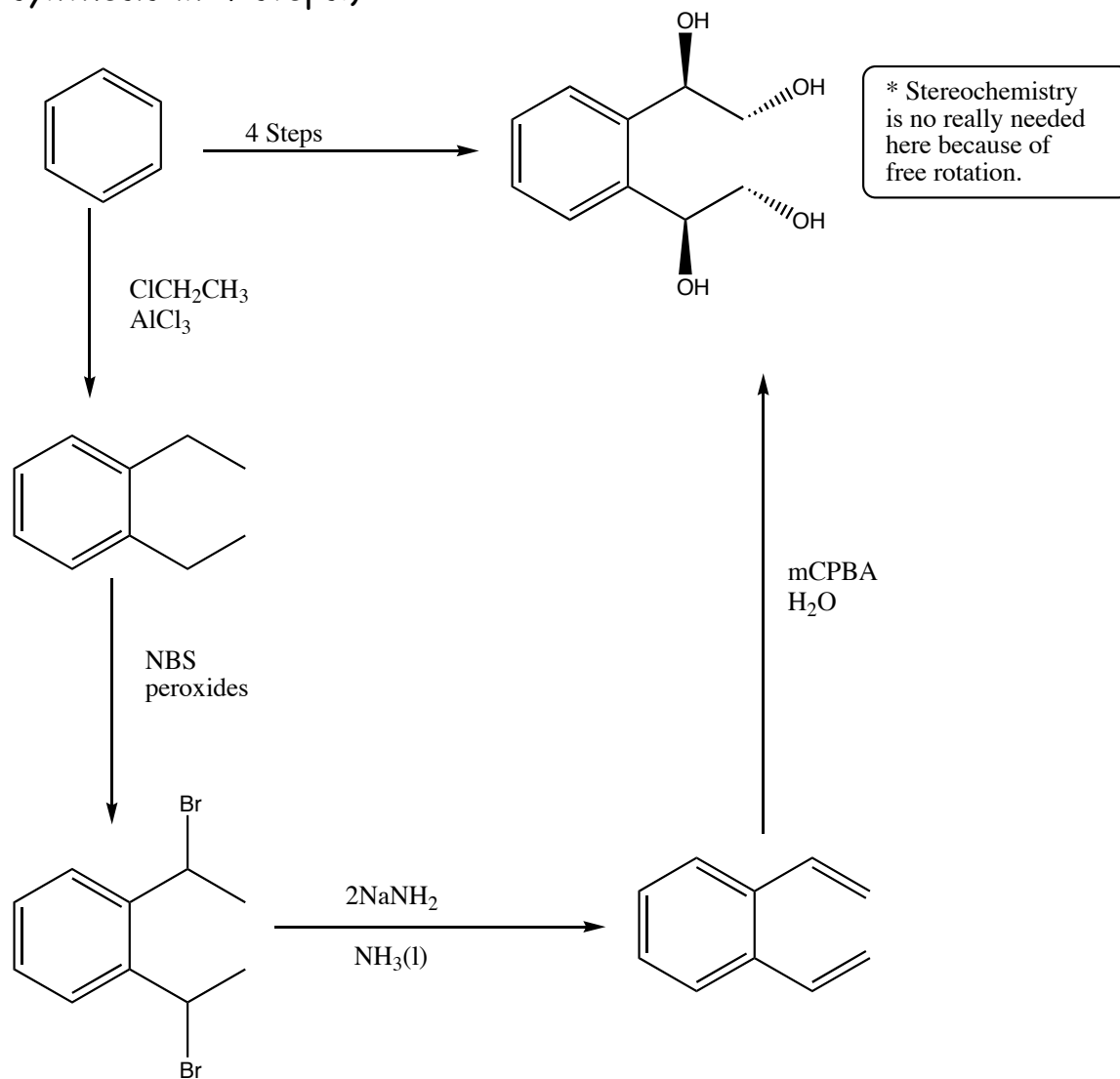
7.) While attempting to conduct a nucleophilic aromatic substitution, your meddling lab partner increases the pressure and temperature to dangerous levels. After performing NMR you come to the conclusion that the structure seen below is your product. What is a possible intermediate of this reaction?



8.) Fill in the empty boxes below.



9.) Synthesize the following molecule. (Hint I performed this synthesis in 4 steps.)



Challenge: Synthesize the following molecule from the given starting material. (Hint it took me 10 steps).

