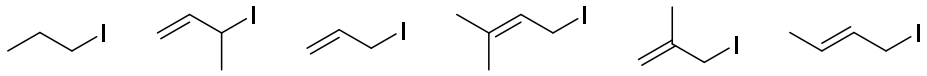
Chem 436 – Spring 2024

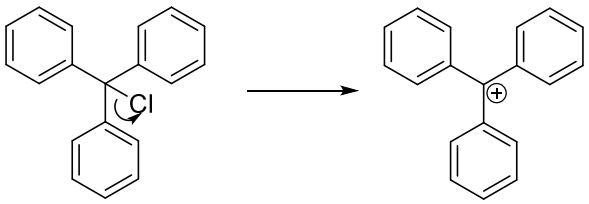
Assignment #1 (Due Feb 2, 2024)

1. When treated under S_N1 condtions, the two chloridees below give the same pair of alcohols in the same ratio. Provide structures for the two alcohols and explain mechanistically.

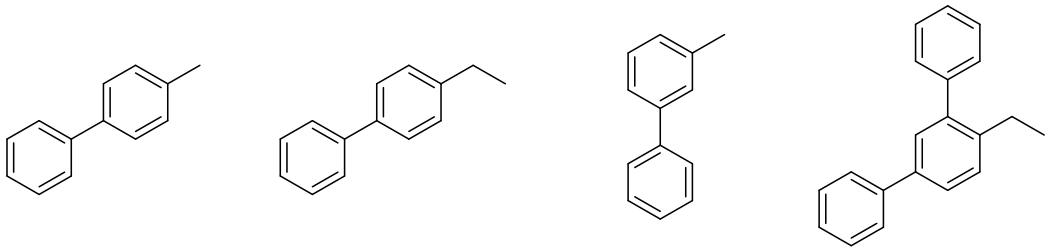
2. Rank the relative rates of S_N2 reactions for the six alkyl and allyl iodides below when they are subjected to ethoxide in ethanol at 45 C. For the compound that you have identified to be the fastest, explain why.



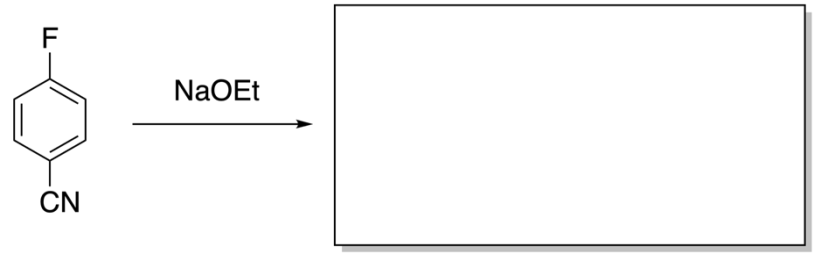
3. Departure of the chloride forms a carbocation. Use arrows to draw ALL resonance structures.

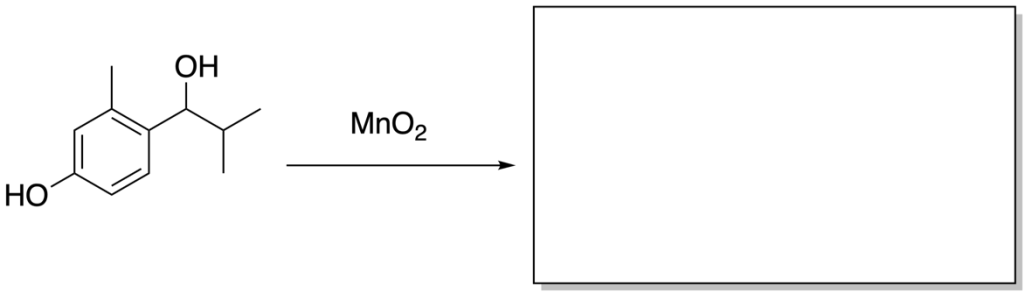


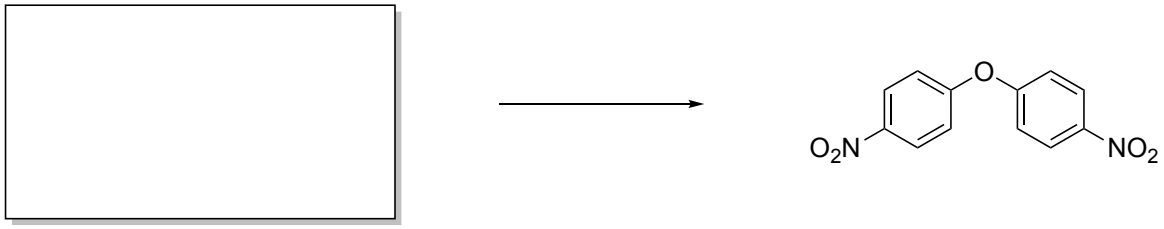
4. Each of the following compounds are treated with Br_2 and light (hv*).* Rank in order of reactivity and explain why.



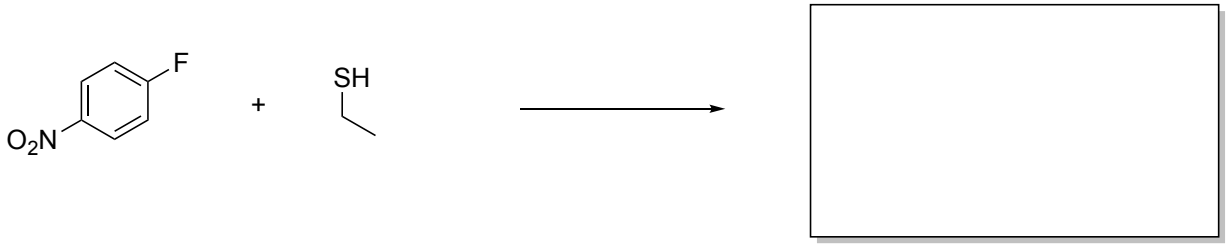
5. Fill in the reagents or predict the product. (4 pts each)







6.



a. Draw the transition state structure for the above SNAr reaction.

b. Indicate the major product formed.

c. Predict what would happen to the rate of the reaction if the solvent was switched from DMSO to THF. All conditions such as concentration and temperature will remain the same.

d. If the nitro group was switched to a -CN or -OMe, what would happen to the rate of the reaction?