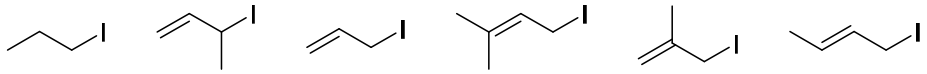
Assignment #2 (Due Feb 3, 2023)

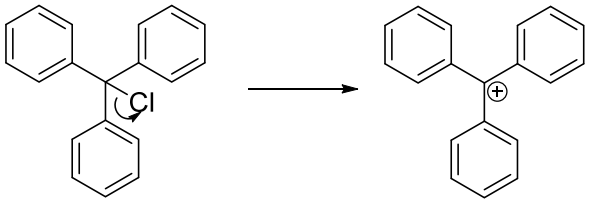
Chem 436 – Spring 2023

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.

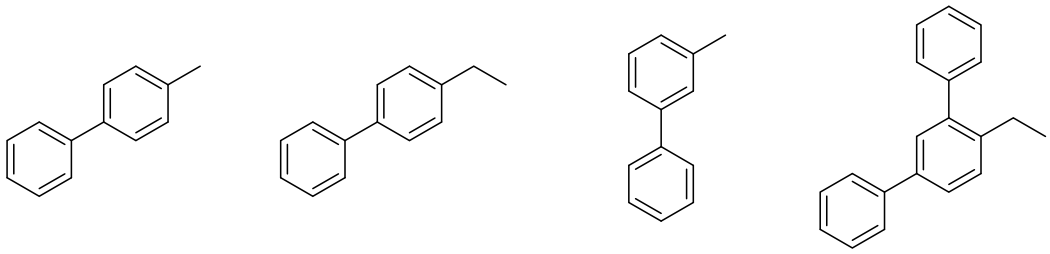
2. Rank the relative rates of S_N2 reactions for the six alkyl and allyl iodides below when they are subjected to ethoxide in ethanol at 45 C. For the compound that you have identified to be the fastest, explain why.



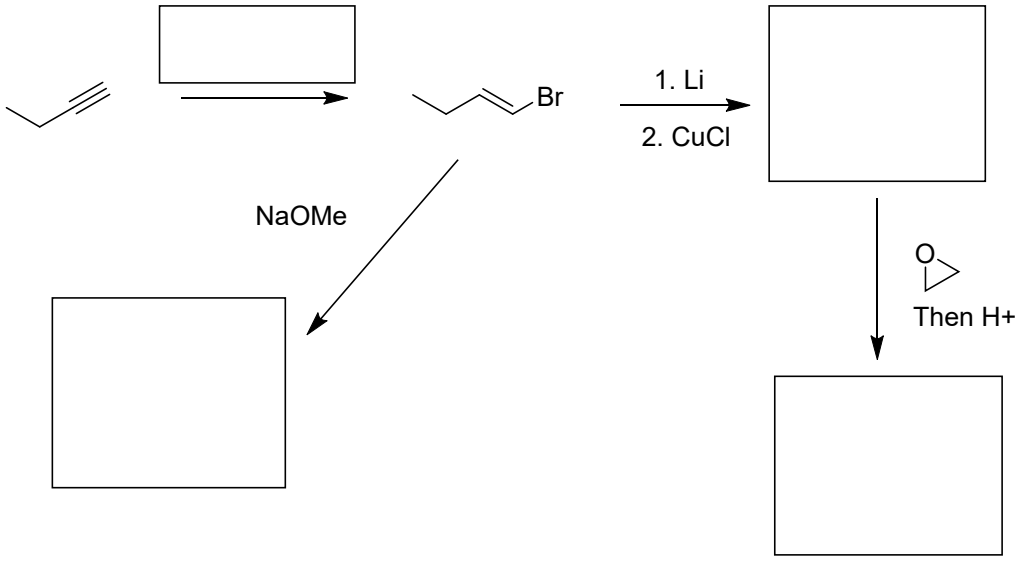
3. Departure of the chloride forms a carbocation. Use arrows to draw ALL resonance structures.



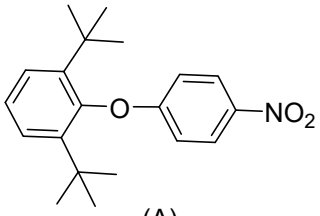
4. Each of the following compounds are treated with Br_2 and light (hv). Rank in order of reactivity and explain why.



5. Complete the following reaction scheme. If any reactions do not work, explain why.



6. A reaction with *para*-chloronitrobenzene with sodium 2.6-di-*tert*-butylphenoxide was carried out with the purpose of synthesizing diphenyl ether (A). However, the product of the transformation was not A, instead, an isomer of A was formed. (Hint: the isomer of A contains a phenolic hydroxy group.)



(A)

7. Arrange the following series in increasing order of pKa of the -OH proton. Give reasons to support your answer.