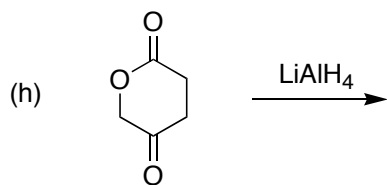
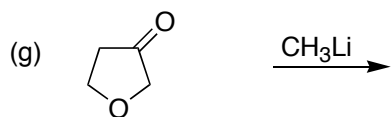
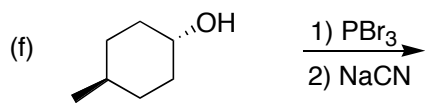
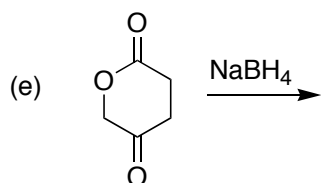
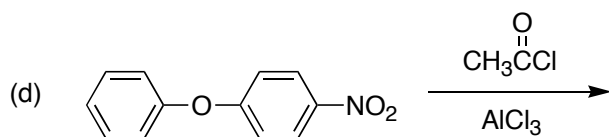
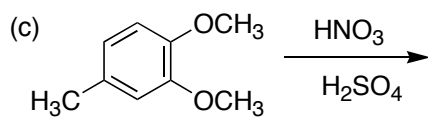
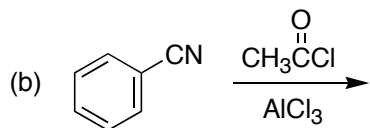
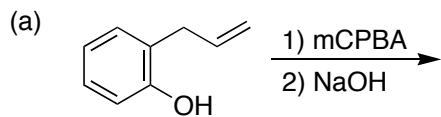
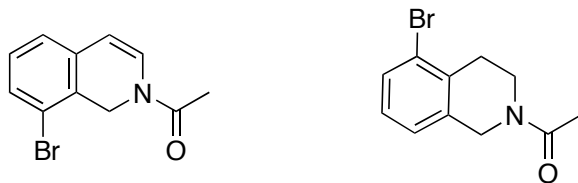


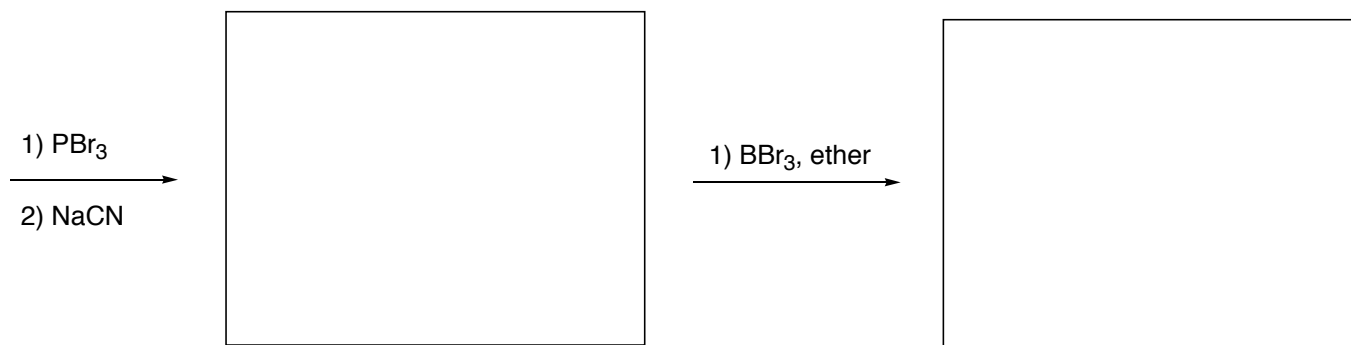
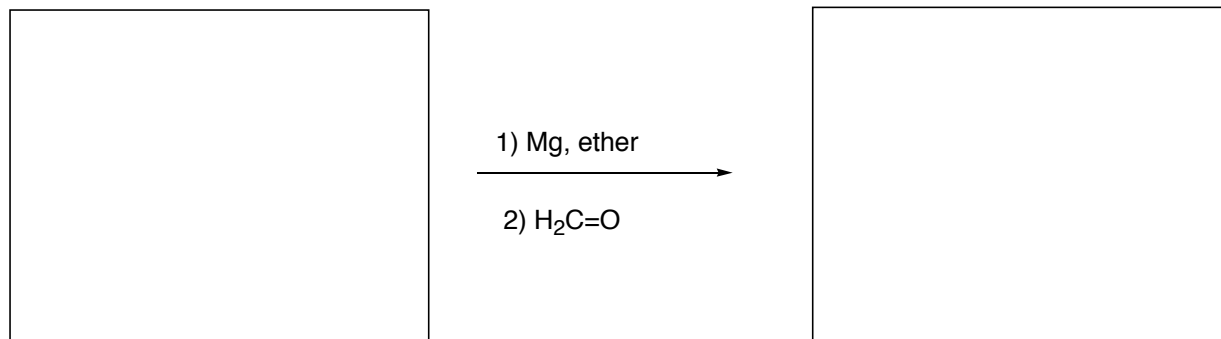
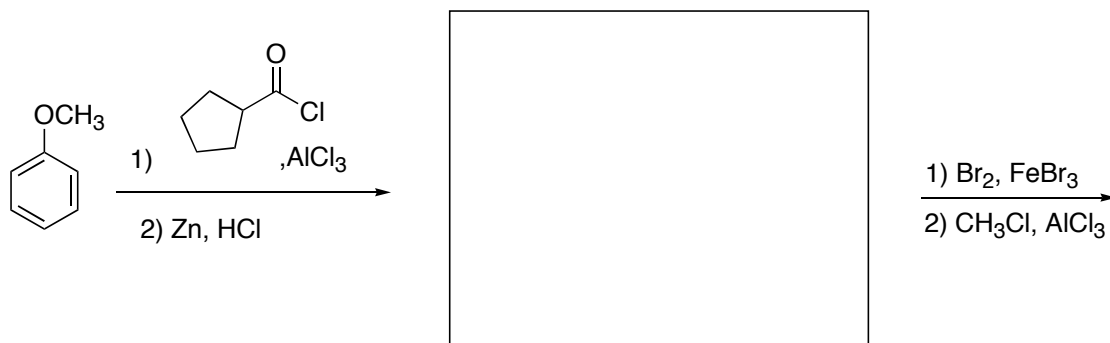
(1) Predict the major product from each reaction. If you expect no reaction, indicate.



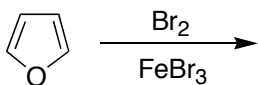
(2) Which of these two aromatic rings is more reactive toward nitration and why.



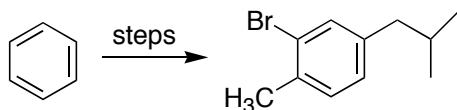
(3) Fill in the compounds in the following roadmap (only show the major product for each step)



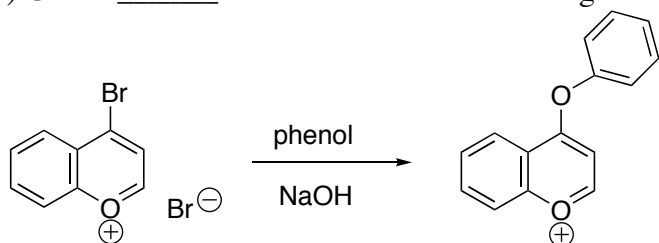
(4) The bromination of furan (below) can produce two different isomers. Draw the two possible products and indicate which is the major and explain your reasoning. (hint: consider the stability of the intermediate cations).



(5) Using benzene as your starting material and any other reagents, synthesize the following molecule.

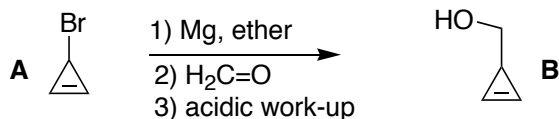


(6) Give a detailed mechanism for the following reaction

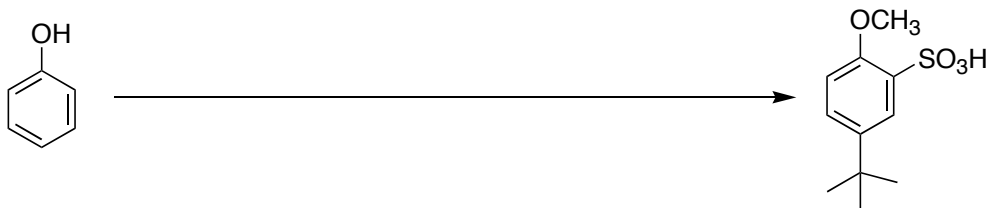


(7) Define "resonance stabilization energy" and give the value for benzene.

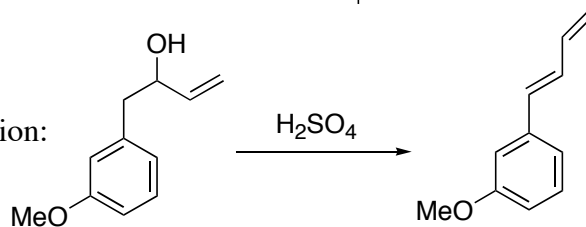
(8) A student wants to convert bromocyclopropene **A** to cyclopropenylmethanol **B** by forming the Grignard reagent and reacting it with formaldehyde. Is this a good idea and if not why?



(9) List the reagents (in order) needed to accomplish the following transformation.



(10) A student was attempting the following reaction:



However, the product only shows 3 signals in the aromatic region of the NMR. What did the student really get and how did it happen?