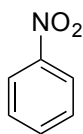
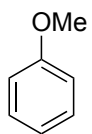


Worksheet 9, Chem 51C, Jarvo

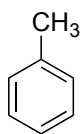
1. Rank the following arenes from fastest to slowest rate in electrophilic aromatic substitution (EAS)



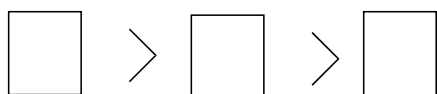
A



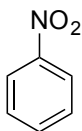
B



C



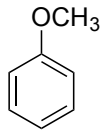
2. Label each directing group as an ortho, meta or para director. You can check more than one box.



ortho

meta

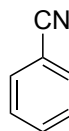
para



ortho

meta

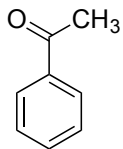
para



ortho

meta

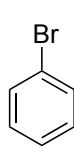
para



ortho

meta

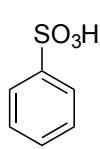
para



ortho

meta

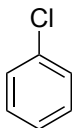
para



ortho

meta

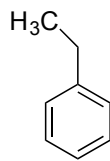
para



ortho

meta

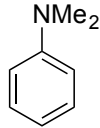
para



ortho

meta

para

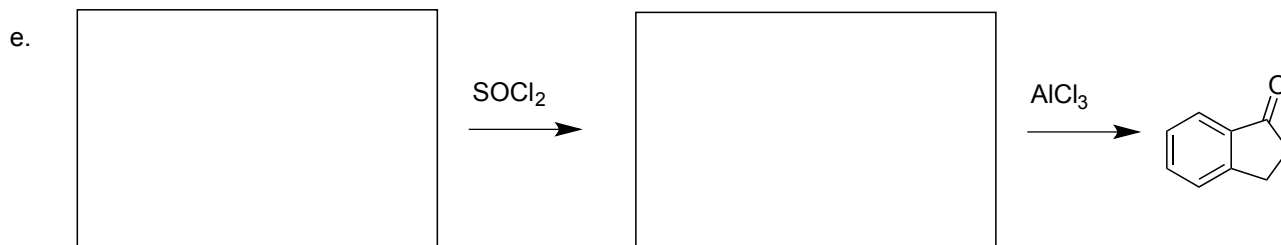
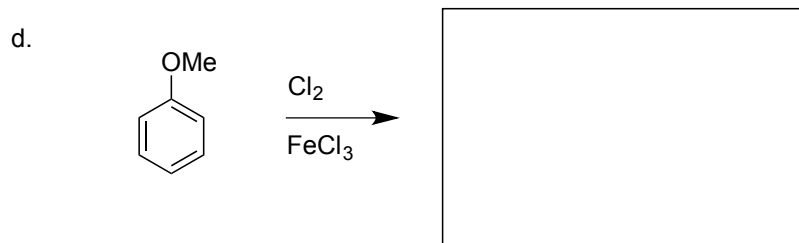
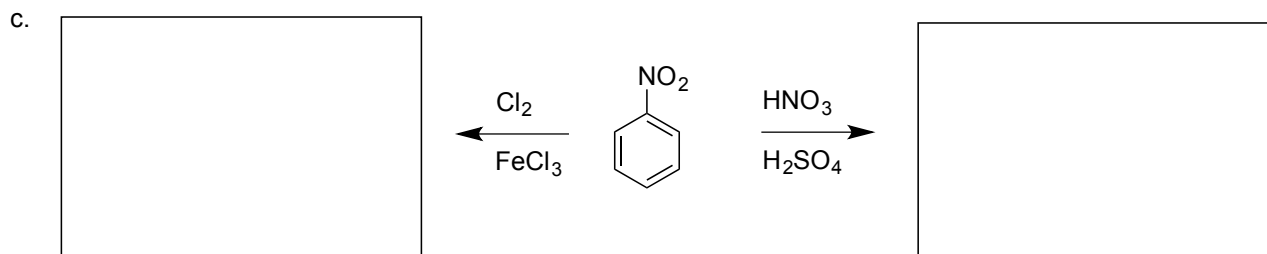
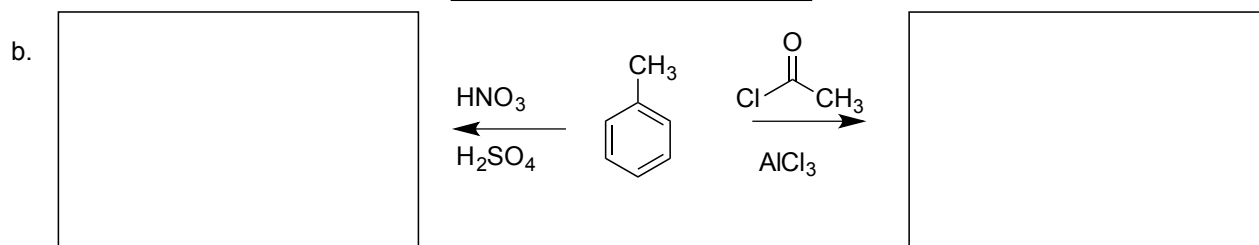
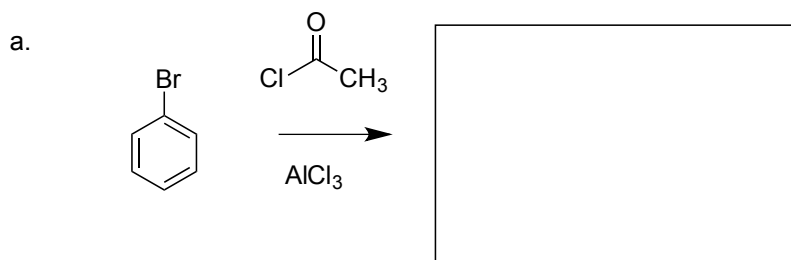


ortho

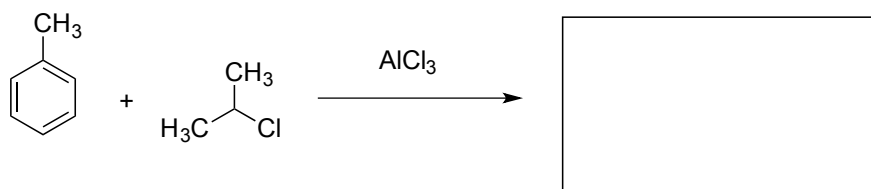
meta

para

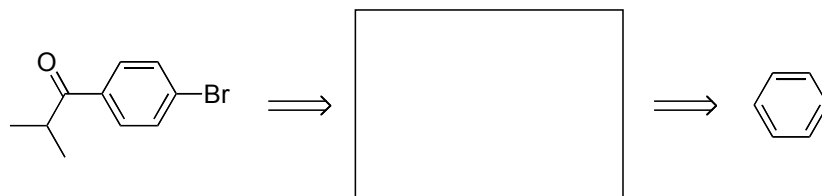
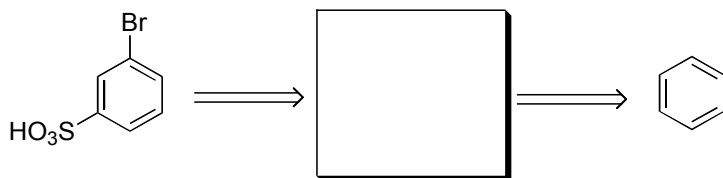
2. Fill in the boxes with the appropriate starting material, reagent or major product.
You can ignore stereochemistry.



3. Predict the products and provide an arrow-pushing mechanism. Draw all resonance structures for intermediates.

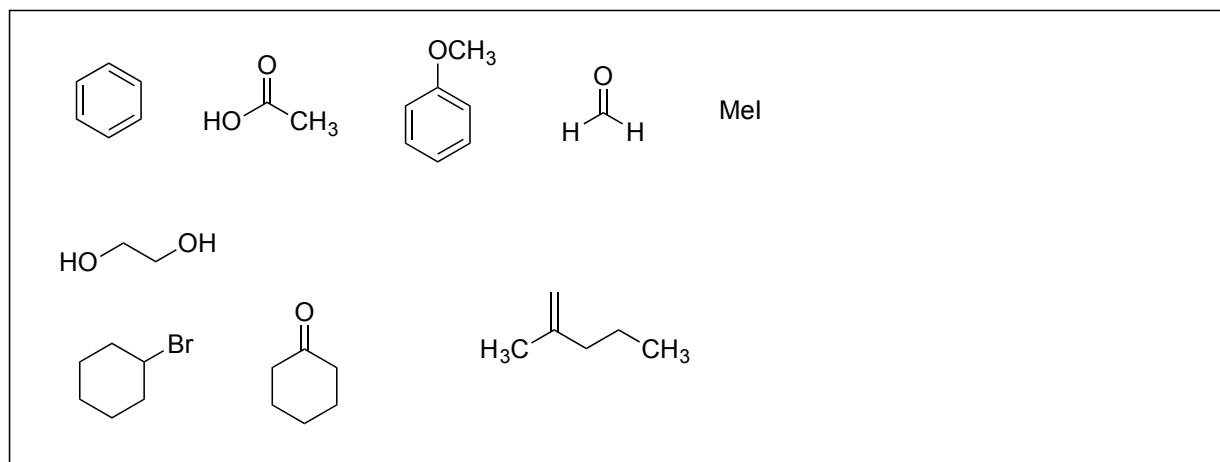


4. Fill in the retrosynthesis with the appropriate compounds.

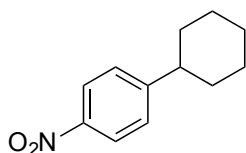


5. Propose syntheses of the targets shown below.

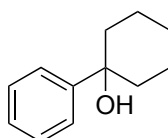
All carbons in the product must come from the starting materials provided, you can use any reagent you wish.



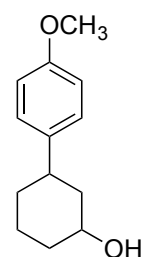
Target A.



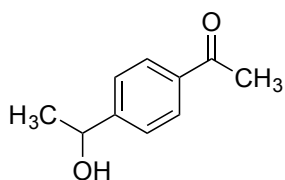
Target B.



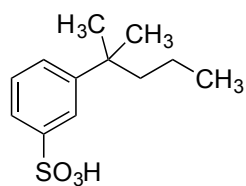
Target C.



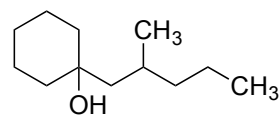
Target D.



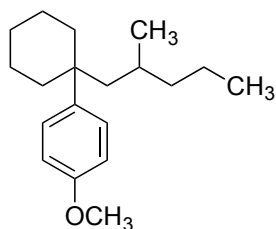
Target E.



Target F

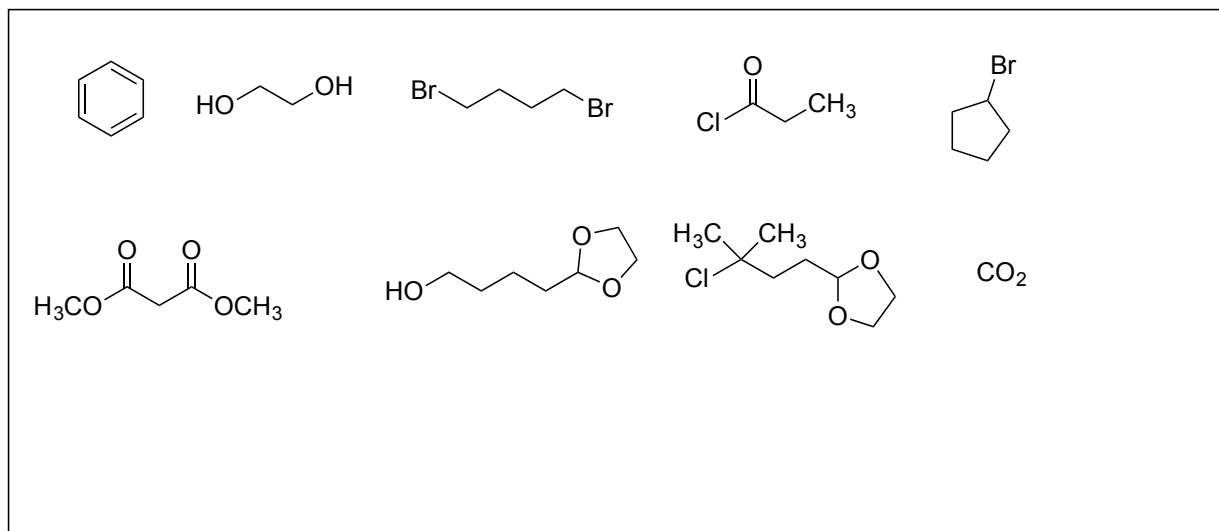


Target G

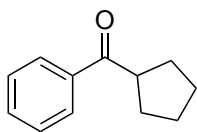


6. Propose syntheses of the targets shown below.

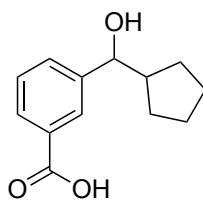
All carbons in the product must come from the starting materials provided, you can use any reagent you wish.



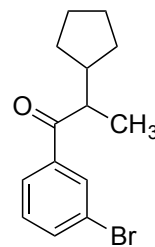
Target A.



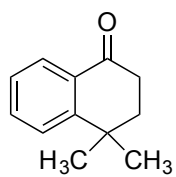
Target B.



Target C.



Target D.



Target E.

