

Chem 231: Problem Set #4 (on Chapter 4)

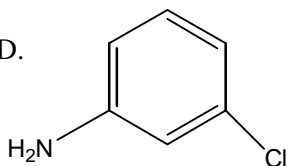
1. Name or draw structures (line or structural formulae) for the following:

A. *sec*-butylbenzene

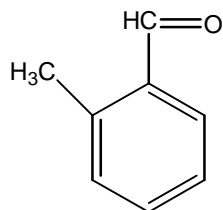
B. *trans*-5-phenyl-3-heptene

C. benzyl bromide

D.



E.

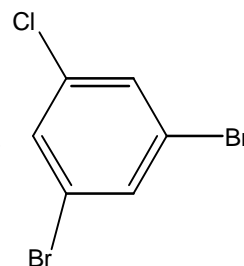


F. *p*-chlorobenzoic acid

G. *m*-xylene

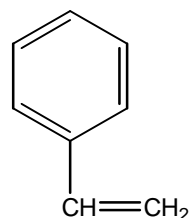
H. *p*-nitrophenol

I.



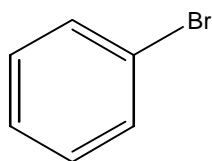
J. 2, 4, 6, -trinitrotoluene (TNT)

K.

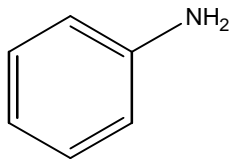


2. Determine if the following groups are ortho, para directors or meta directors. Also, determine if the following groups are ring activators or deactivators.

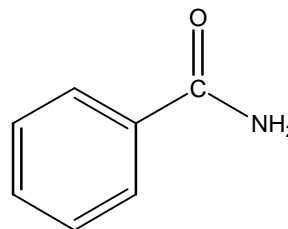
A.



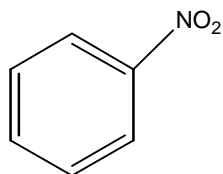
B.



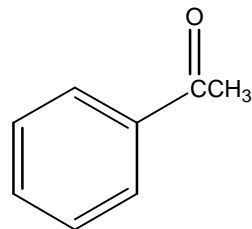
C.



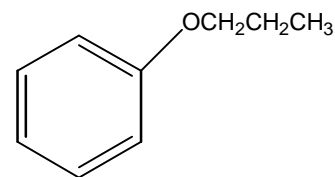
D.



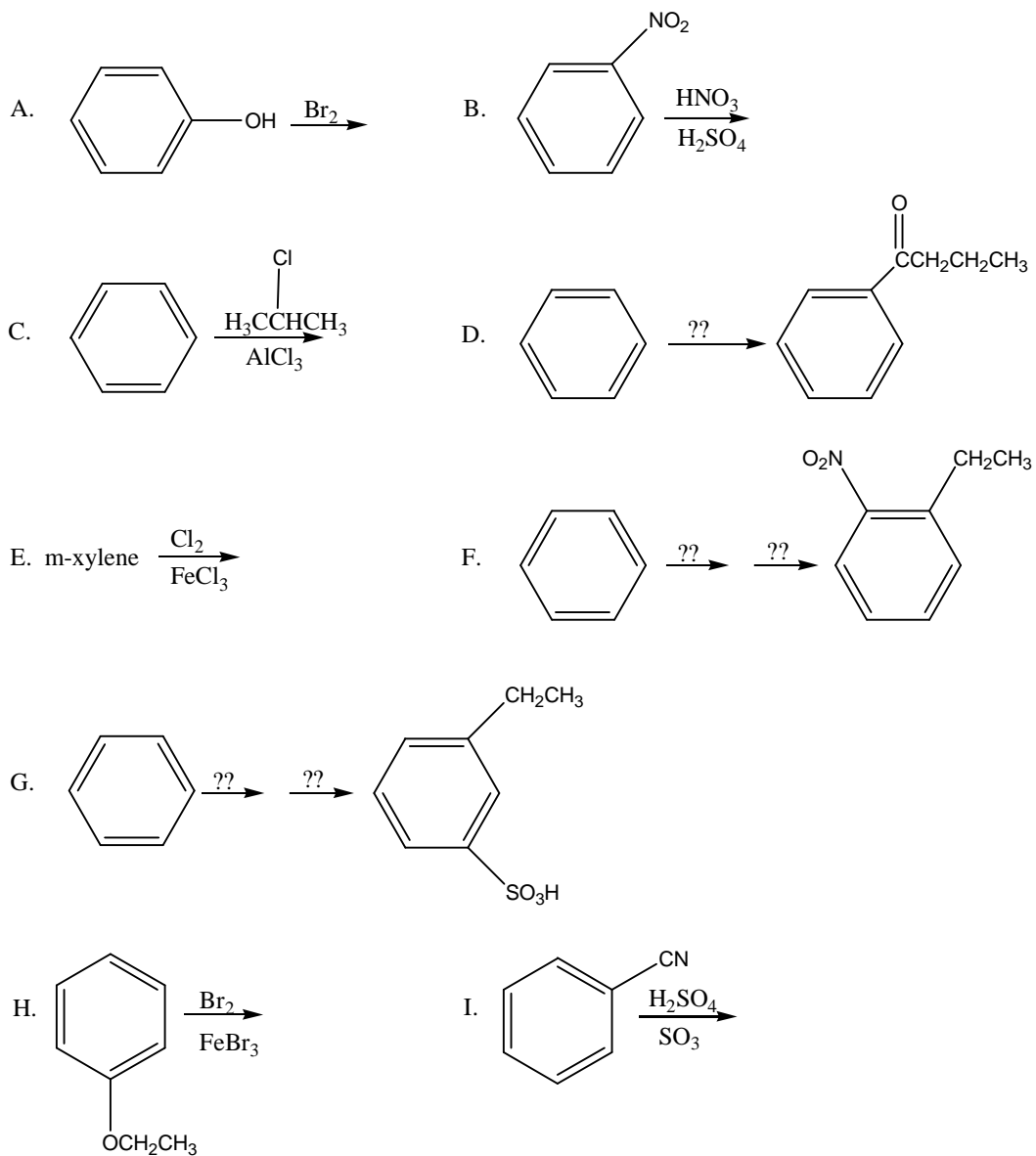
E.



F.



3. Give the major organic product(s) or reagents needed for the following reactions.



4. The group $-\text{OCH}_3$ is known to be an ortho/para director. Compare and contrast attack of the strong electrophile Cl^+ (produced from Cl_2 and FeCl_3) on the meta and para positions of anisole. Show all resonance structures for the intermediate carbocation and explain why attack at the para position is preferred over attack at the meta position.

