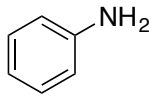
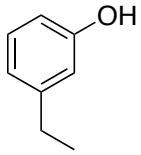
Problem Set #3: Chapters 22 - KEY

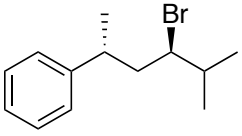
1. Name the following compounds



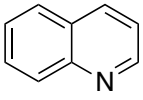
Amino benzene (Aniline)



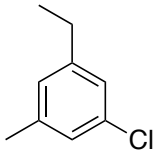
m-ethyl phenol



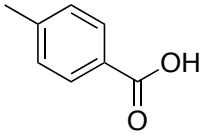
(2R, 4R) 3 bromo- 2-methyl-5-phenyl hexane



Quinoline

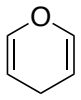


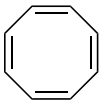
3 chloro- 5-ethyl toluene

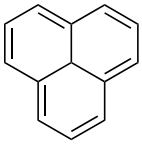


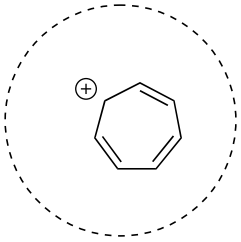
p-methyl benzoic acid

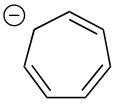
2. Which of the following compounds are aromatic?

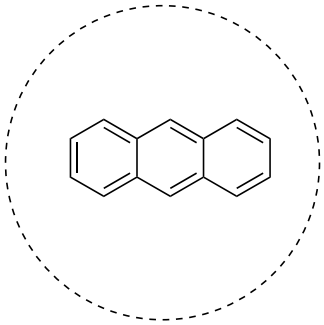




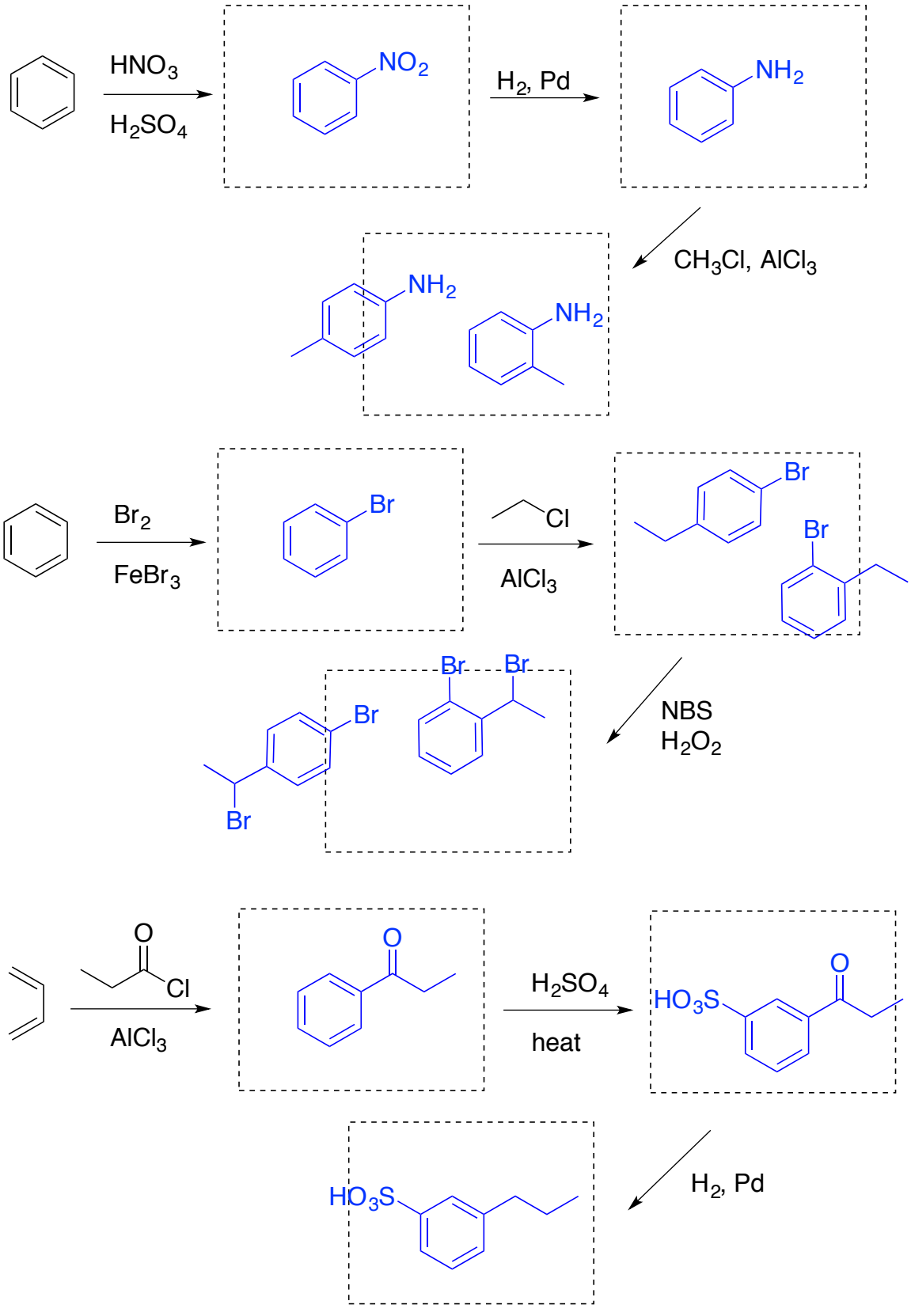


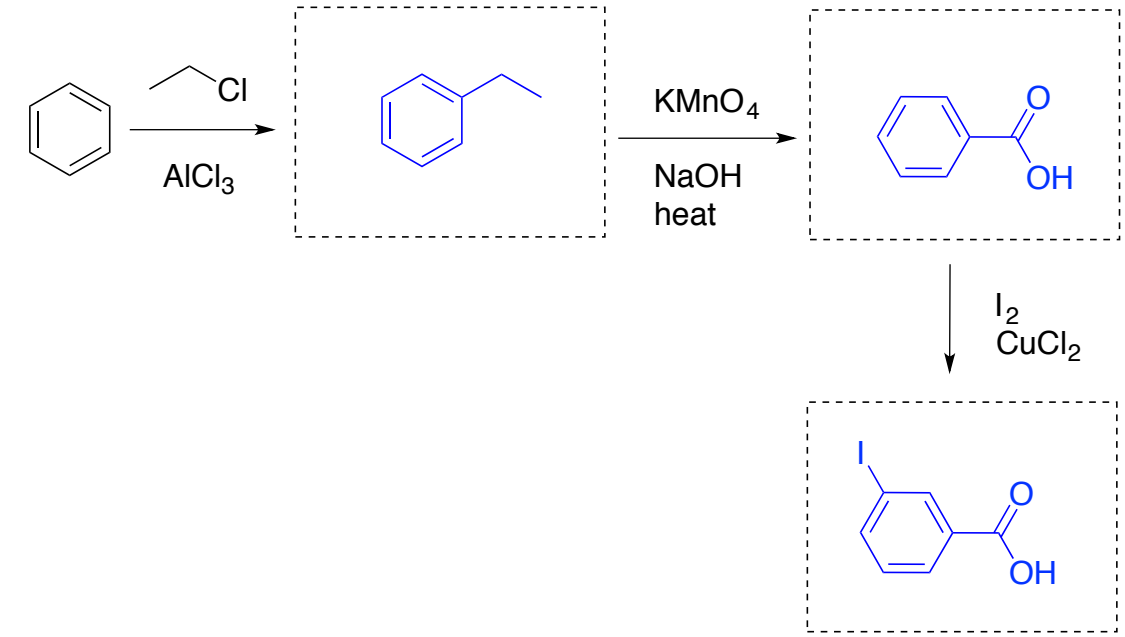


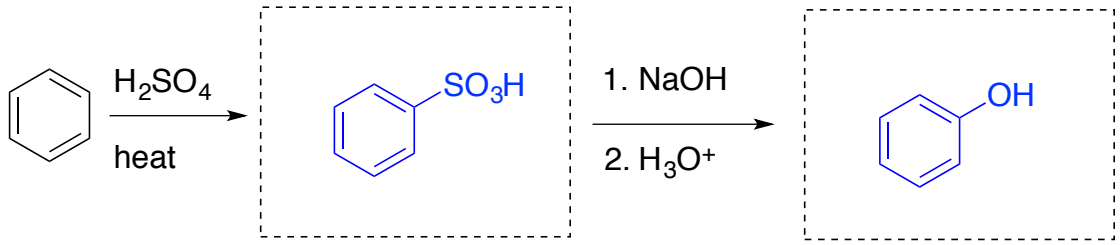


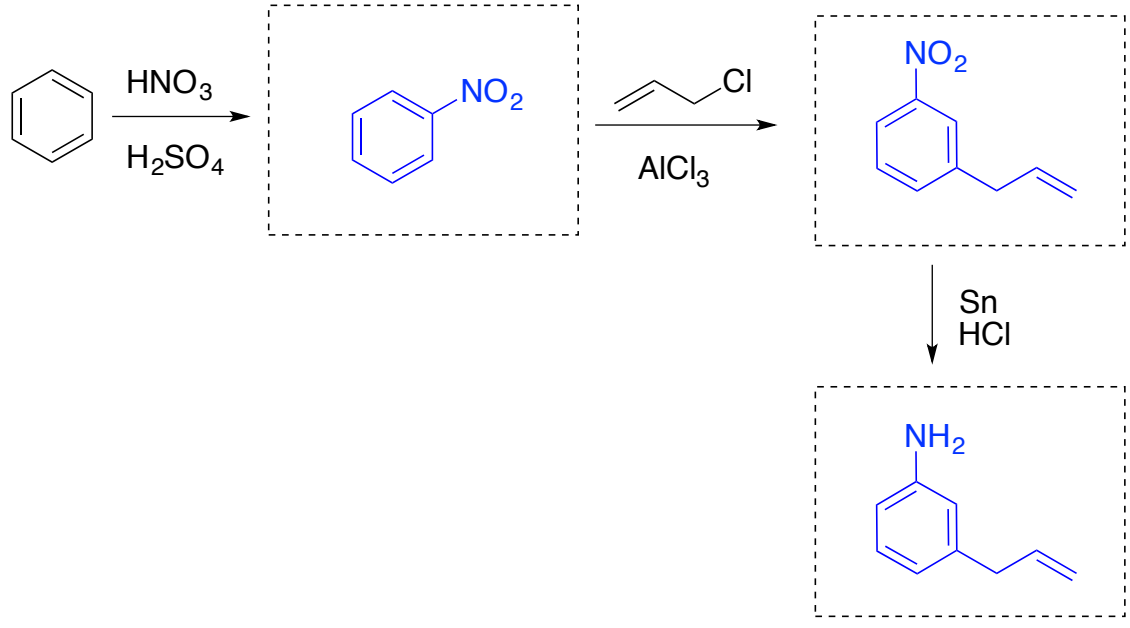


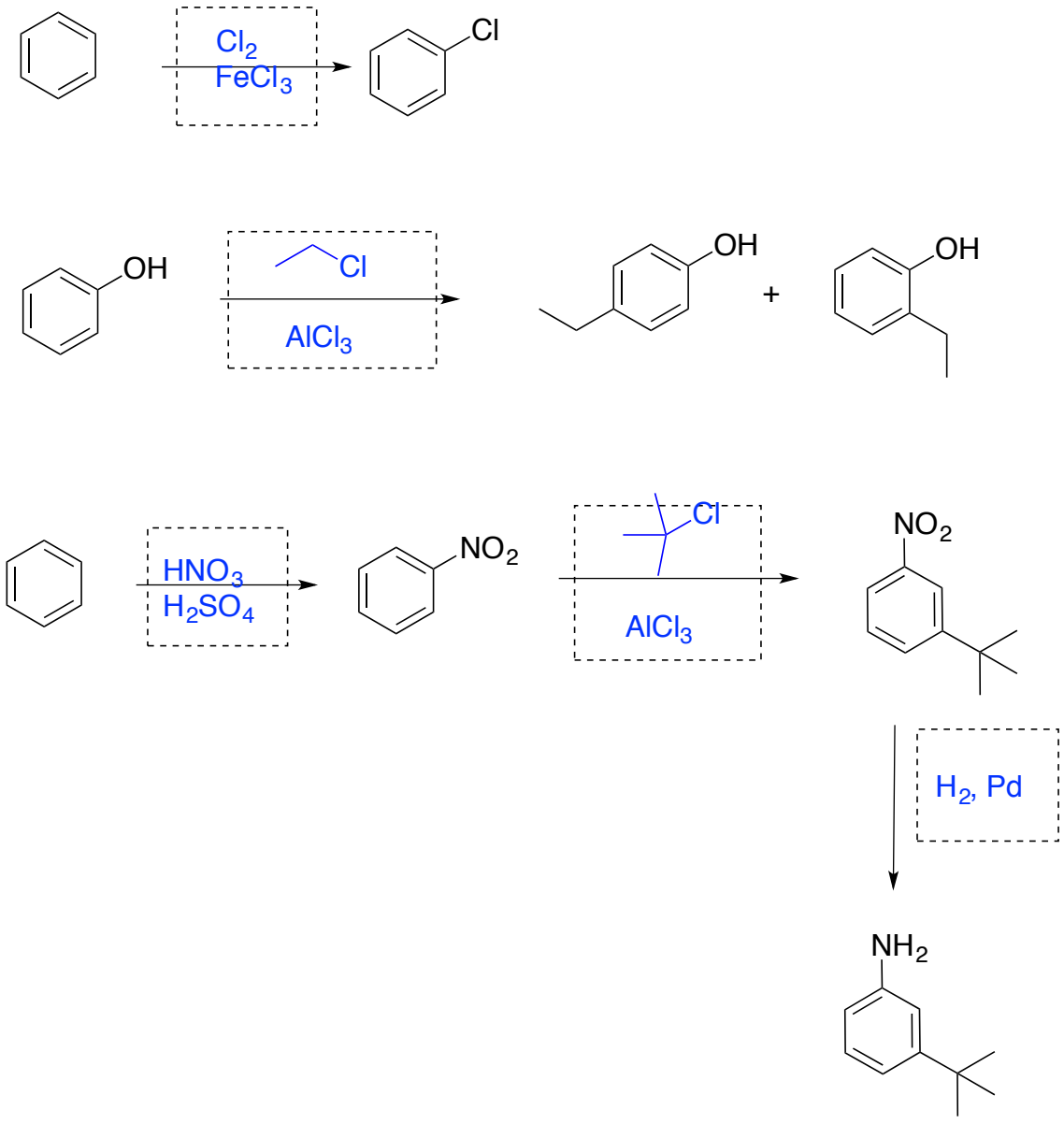
3. Complete the following transformations



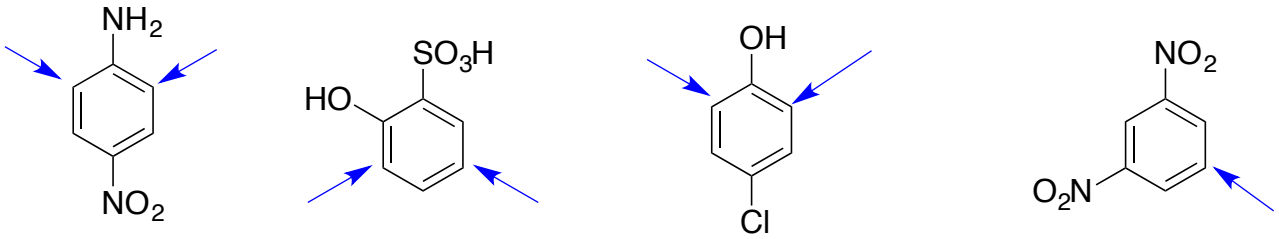

Cl
AlCl3
KMnO4
NaOH
heat
O
OH
I2
CuCl2
I
O
OH


H2SO4
heat
SO3H
1. NaOH
2. H3O+
OH

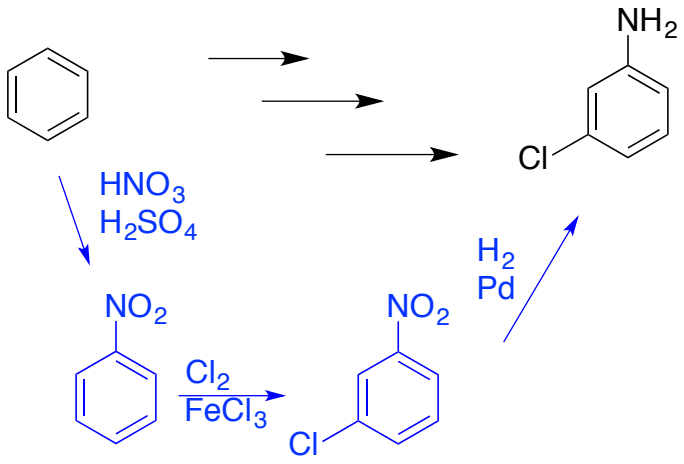

HNO3
H2SO4
NO2
Cl
AlCl3
NO2
Sn
HCl
NH2

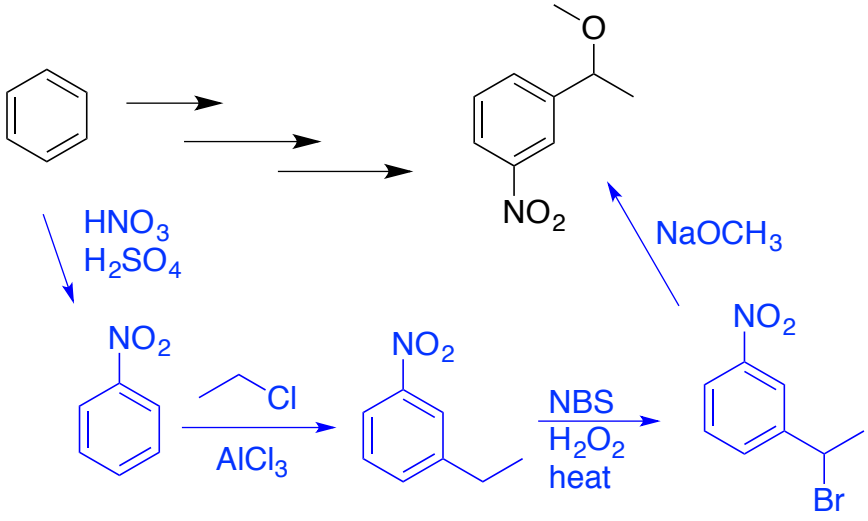


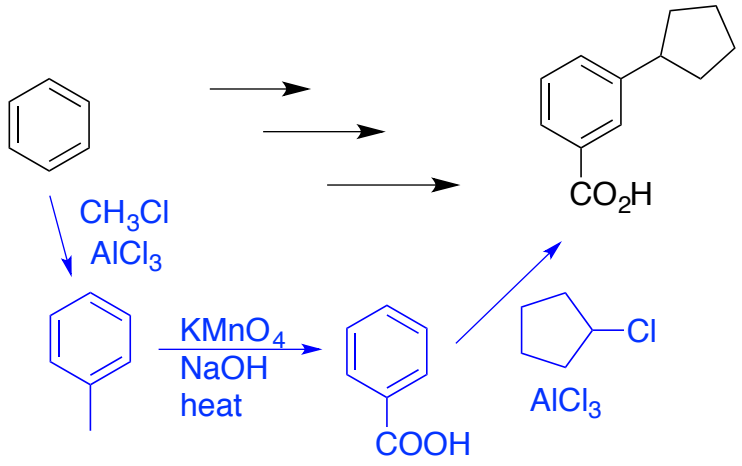
4. Determine where a 3rd electrophile would add to the following benzenes:

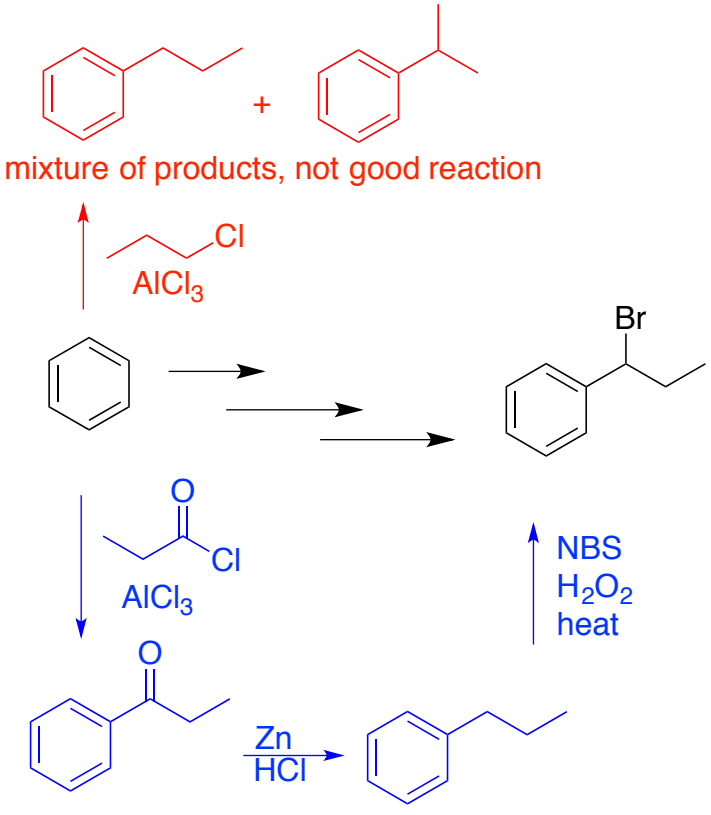


5. Provide a synthesis for the following molecules starting from benzene (you need to go through several steps and/or use some reactions from CEM251):



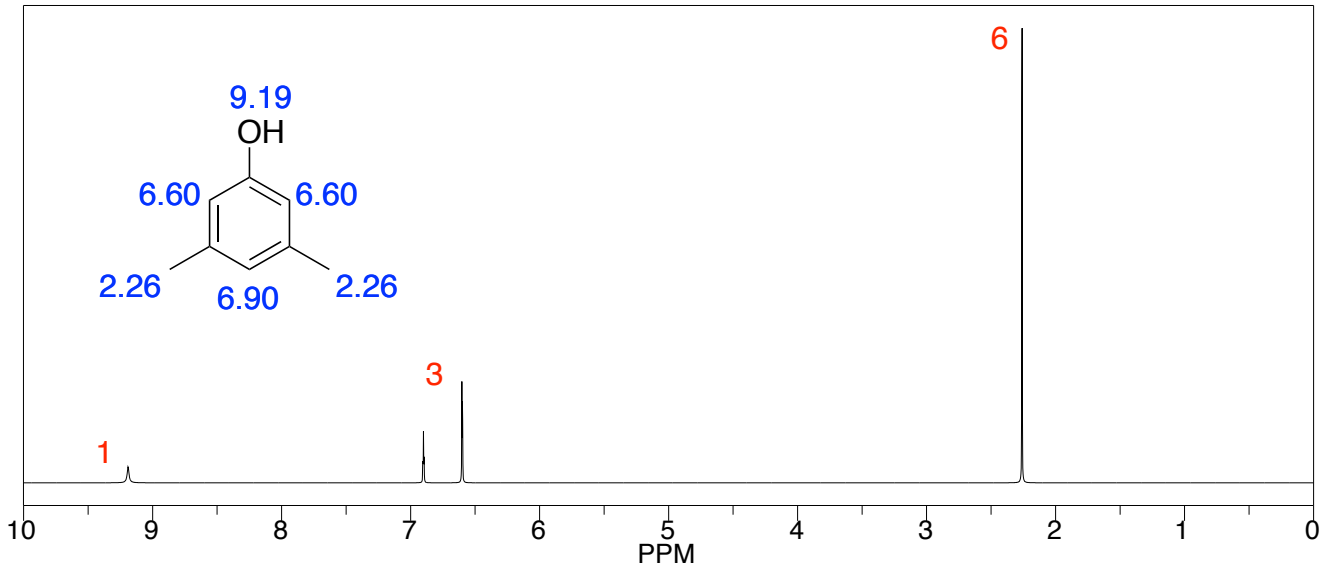



CO2H
CH3Cl
AlCl3
KMnO4
NaOH
heat
COOH
Cl
AlCl3


+
mixture of products, not good reaction
Cl
AlCl3
Br
O
Cl
AlCl3
NBS
H2O2
heat
O
Zn
HCl

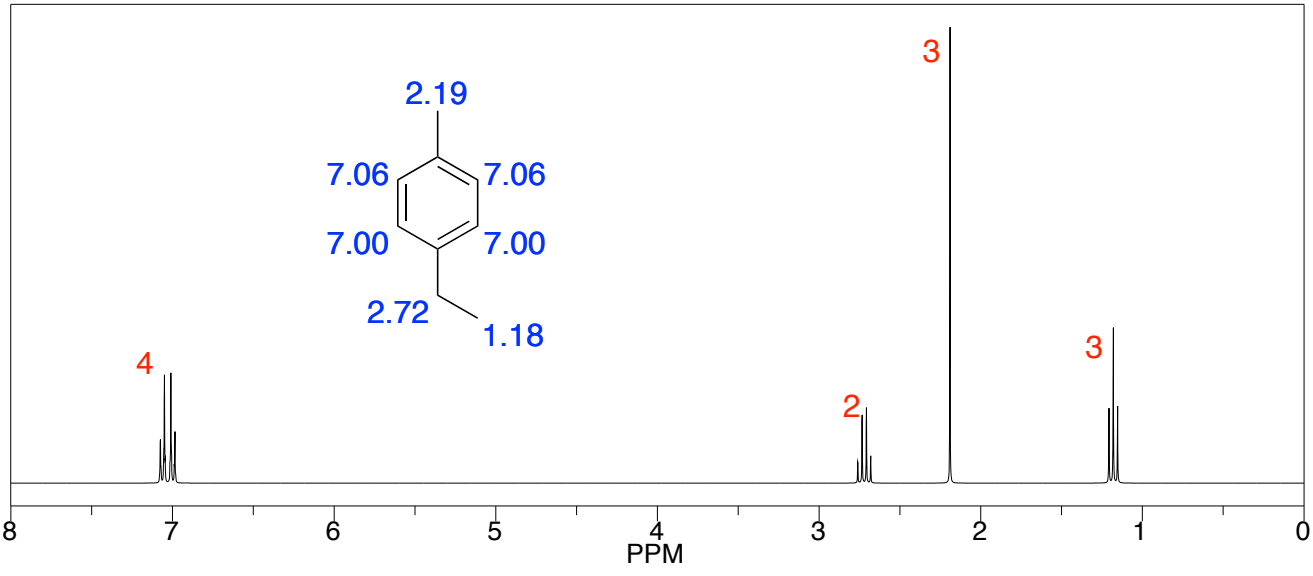
6. Determine the structure of the following compounds based on their 1H-NMR spectra:

A. $C_8H_{10}O$



2.24 ppm (s, 6H); 6.60-6.90 ppm (3H); 9.20 ppm (broad singlet, 1H)

B. C_9H_{12}



1.18 ppm (t, 3H); 2.19 ppm (s, 3H); 2.72 (q, 2H); 7.00-7.06 ppm (4H)