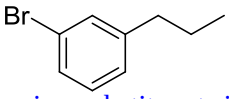
Name_____ Date_____

Organic Chemistry 2

Quiz 3

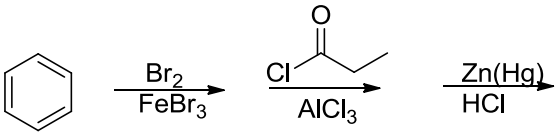
1. Which of the following reaction sequences would be the best for synthesizing 1-bromo-3-propylbenzene? Circle your answer choice. To receive partial credit (if your selection is incorrect), show the products for each step.

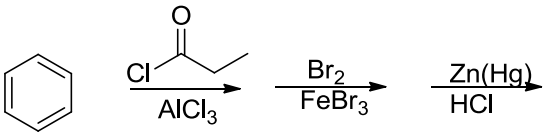
6 pts. (1.5 pt for each correct product if overall answer incorrect)

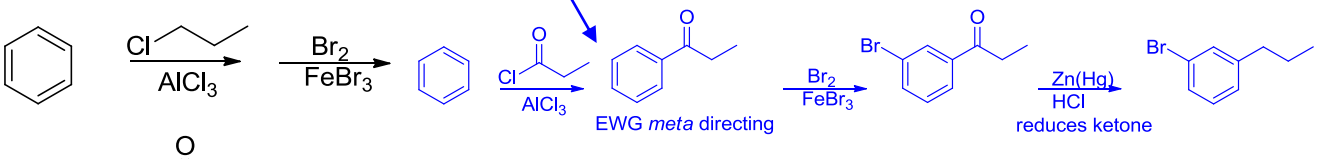


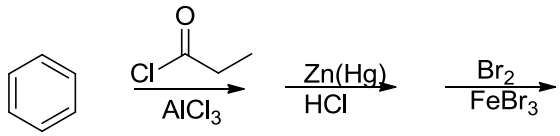
1-bromo-3-propylbenzene

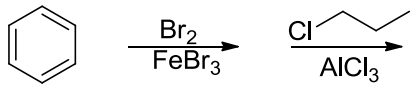
The ring substituents in the product are *meta*, therefore the first step must be FC acylation (places a *meta* directing (EW) group on the ring). If you reduce the ketone to an alkyl group before bromination (choice d) the bromine will go *o/p* to the propyl group rather than meta. Bromination must be performed before reduction, to achieve meta substitution. Choices c & d are incorrect because the first step places *o/p* directing groups on the aromatic ring. Additionally, rearrangement of the FC carbocation intermediate will result in an isopropyl group on the ring.

a. 

b. 

c. 

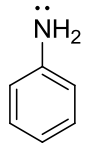
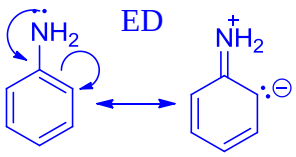
d. 

e. 

2. Circle the *meta* directing groups from the following list of substituents: 4 pts

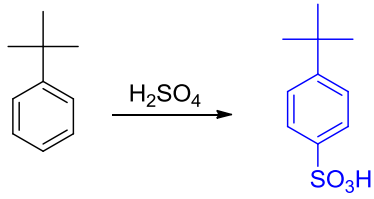
$-NO_2$ $-CF_3$ $-C{\equiv}N$ $-CHO$

3. Complete the following table for aniline. Show resonance structures when appropriate. 4 pts

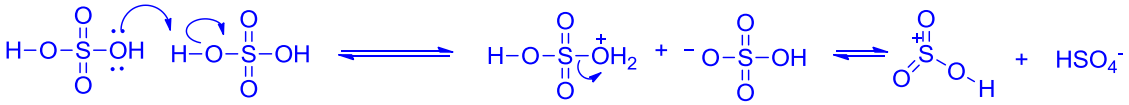
	Induction	Resonance	OVERALL	o/p or m director
		EW/ED/NA	EW/ED	op / m
	EW	 ED	ED→resonance larger effect than induction	o/p→more e^- density on o/p positions

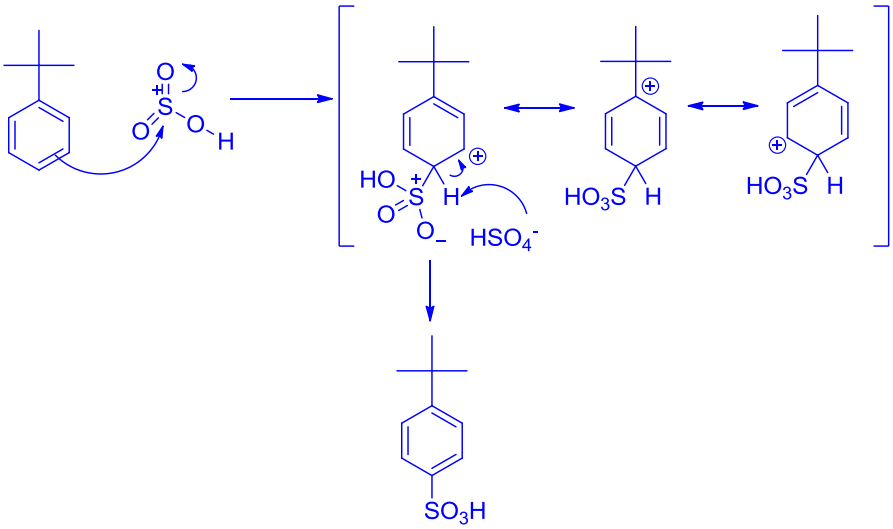
Must show resonance for full credit

4. Sulfuric acid will generate an electrophile *in situ* to sulfonate the benzene ring via electrophilic aromatic substitution. Predict the product(s) for the EAS reaction shown below. Show the complete reaction mechanism, and include all resonance structures and charges. 6 pts



Sterics prevent ortho product from forming!





Generating electrophile: 1 pt

Resonance structures: 2 pts

EAS mechanism: 2 pts

Products: 1 point (para due to sterics: 0.5 pt)