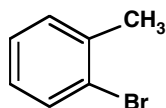


JASPERSE CHEM 350 TEST 4 VERSION 1
 Conjugation, Diels-Alder, Aromaticity, Aromatic Reactions

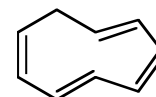
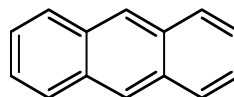
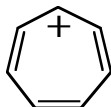
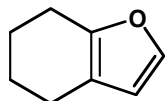
1. Provide the Name or Structure for the Following (7 points)



m-nitroaniline

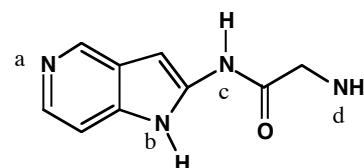


2. Circle the aromatic molecules (6 points)

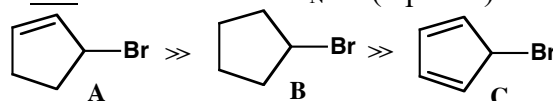


3. For each nitrogen in the molecule, classify the hybridization of the nitrogen atom, the hybridization of the nitrogen lone pair, and classify whether the basicity of the nitrogen is “normal” or “low”. (5 points)

	Nitrogen Hybridization	Lone-Pair Hybridization	Nitrogen Basicity
N _a			
N _b			
N _c			
N _d			

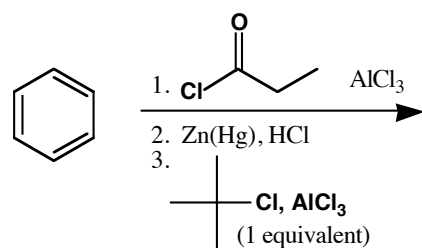
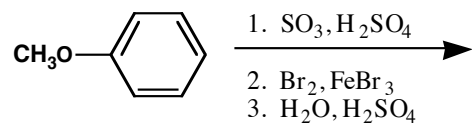
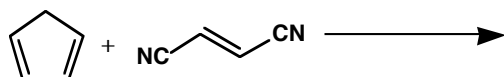
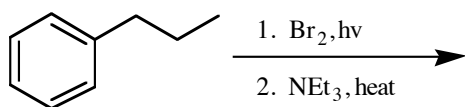
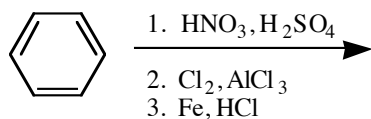
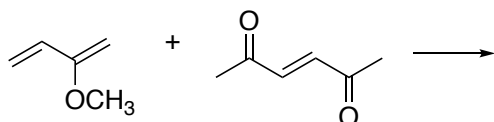
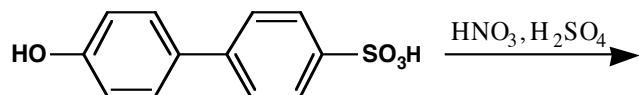


4. Bromide **B** has normal reactivity (for a 2° bromide) toward S_N1 substitution, but **A** has much higher reactivity and **C** has much lower reactivity. a) Why is **A** more reactive toward S_N1? b) Why is **C** much less reactive toward S_N1? (4 points)

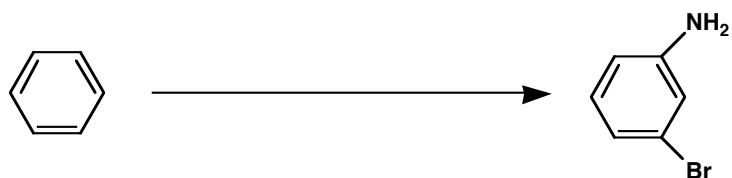
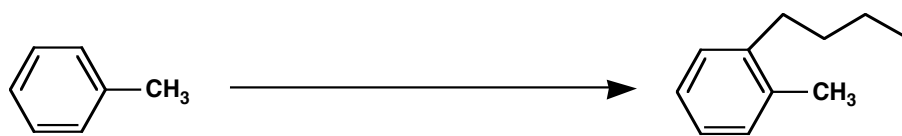


Kinetic reactivity toward
S_N1 reactivity (H₂O, H⁺)

5. Synthesis Reactions. Draw the feature product of the following reactions (need not show any byproducts). (21 points, 3 points each)



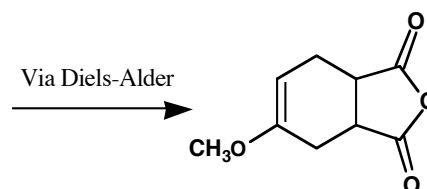
6. Design sequences for the designated conversions. (5 points each)



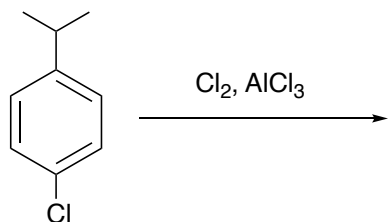
7. Design a synthesis for the following molecule beginning with toluene. (6 points)



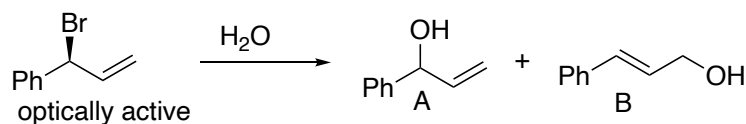
8. Draw the Reactants for the following (3 points)



9. a) Draw the major product for the following reaction, and b) draw the mechanism for its formation. c) Identify the slow step. d) Draw all the resonance structures for the cation intermediate. (7 points)



10. (9 points total) a) Draw the mechanism for the following reaction, in which a common intermediate gives rise to both products.



b) In the above reaction, is product A chiral or achiral?

c) Which is the "thermodynamic" product (more stable, which builds up under equilibrating conditions)?

d) You probably already did this, but either re-draw or identify the two key resonance structures for the intermediate in the mechanism above. (You can just circle the two of them, assuming you already sketched them above.).

11. Rank the following, with 1 being highest/most. (2 points each)

