



Chem 342 • Organic Chemistry II

Exam 02 • 13 March 2009

KEY



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Please read through each question carefully and answer in the spaces provided. A good strategy is to go through the test and answer all the questions you can do easily. Then go back and tackle the more difficult problems. Please make sure your structures are drawn clearly and indicate any stereochemistry with bold or dashed bonds. Finally, think about what you know. Reason and common sense can often help you out.

Problem 1 12 pts _____

Problem 6 21 pts _____

Problem 2 10 pts _____

Problem 7 18 pts _____

Problem 3 8 pts _____

Problem 8 15 pts _____

Problem 4 8 pts _____

Problem 5 8 pts _____

TOTAL 100 pts _____

1. Indicate whether the following statements are True for False. (12 pts)

T The rate of nucleophilic aromatic substitution increases if you place more electron withdrawing groups on the benzene ring.

T Potassium permanganate will not oxidize *tert*-butylbenzene to benzoic acid.

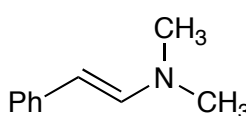
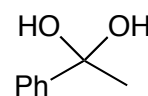
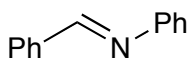
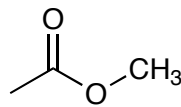
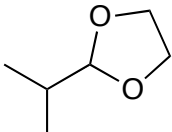
T Phenol (hydroxybenzene) is significantly more acidic than methanol.

T Oxymercuration is a good method to make tertiary alcohols.

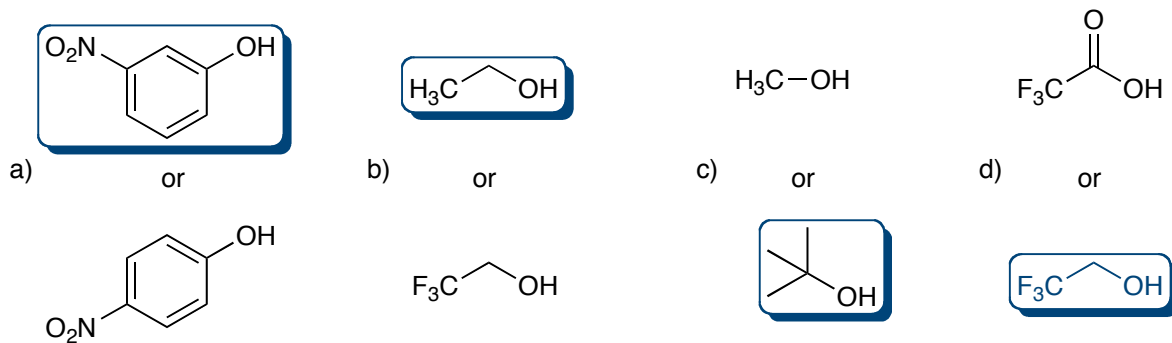
T Aldehydes and ketones are more electrophilic than esters.

T Lithium aluminum hydride (LiAlH_4) will reduce a carboxylic acid to an alcohol.

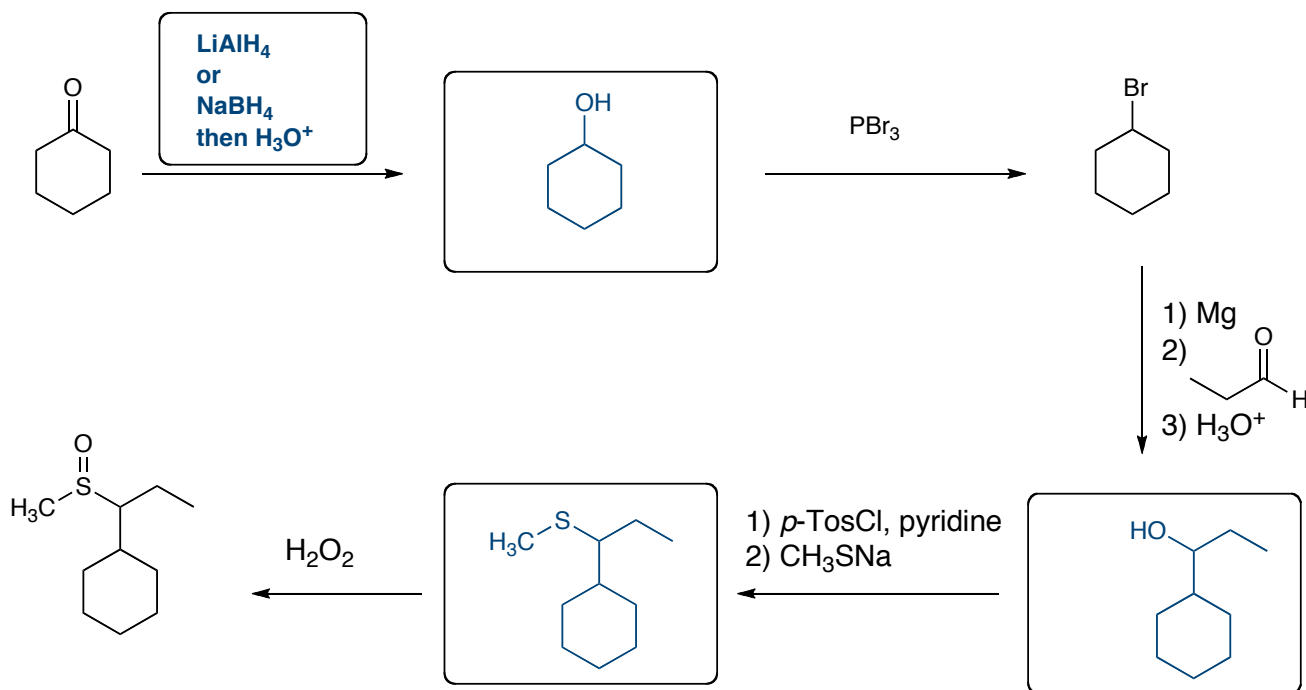
2. Place a check mark in the box for the functional group that best describes each of the following structures. (10 pts)

		ketone hydrate	acetal	imine	ester	aldehyde	enamine
a)		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
b)		<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
c)		<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
d)		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
e)		<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

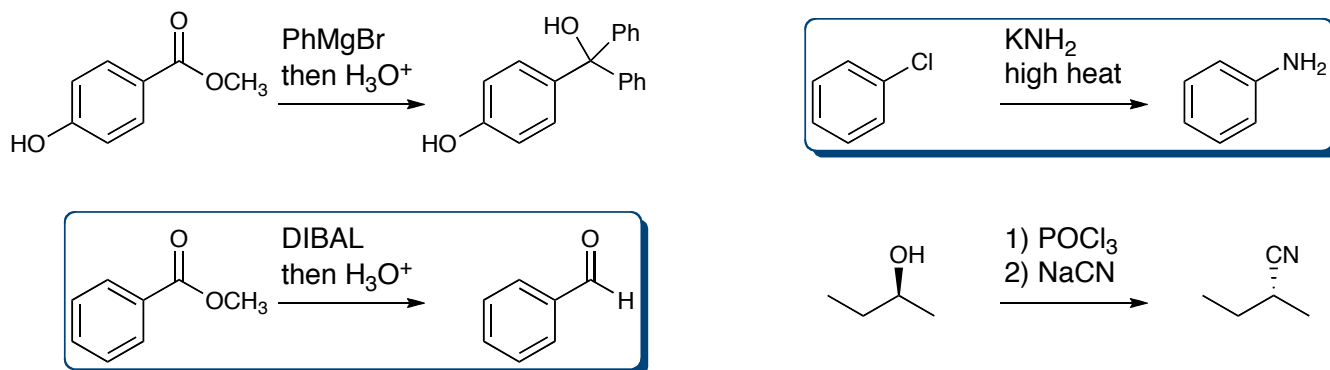
3. For each pair of molecules, circle the one that is *least* acidic. (8 pts)



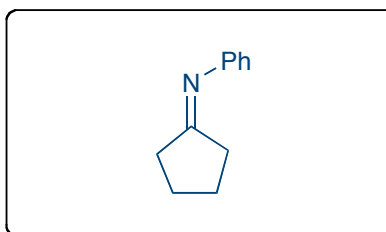
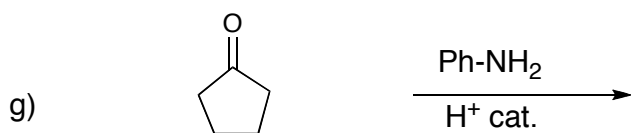
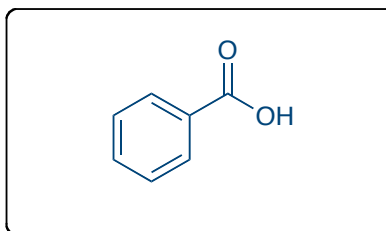
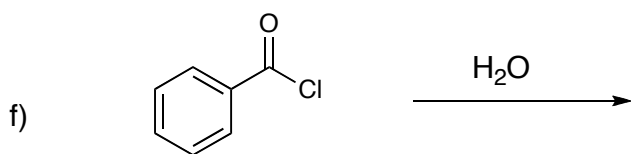
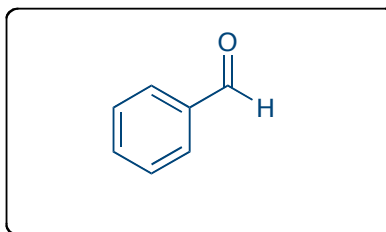
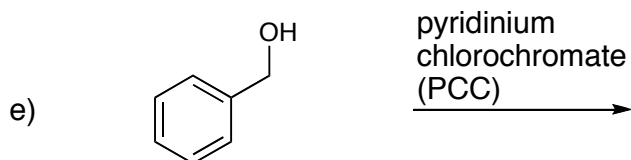
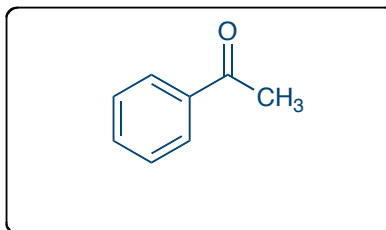
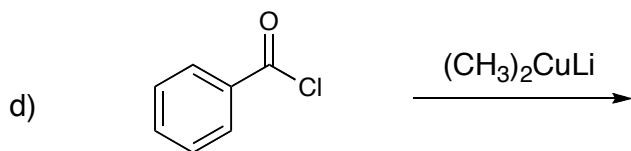
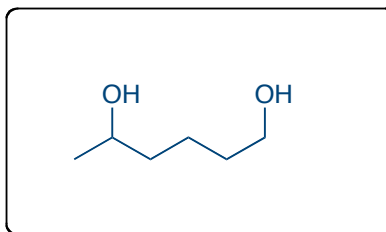
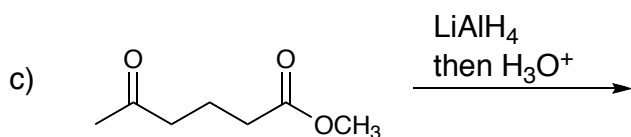
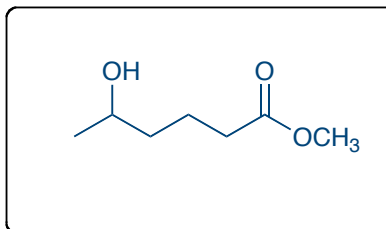
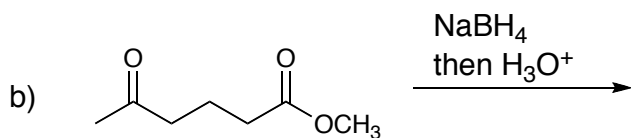
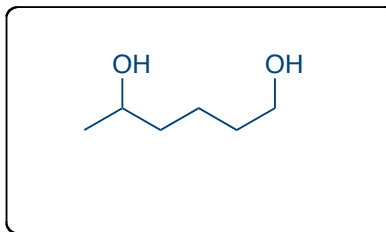
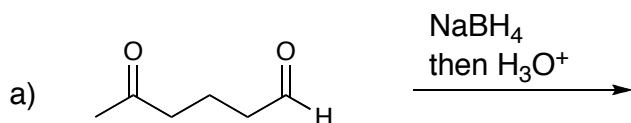
4. Fill in the missing structures and reactants for the following multistep synthesis. (8 pts)



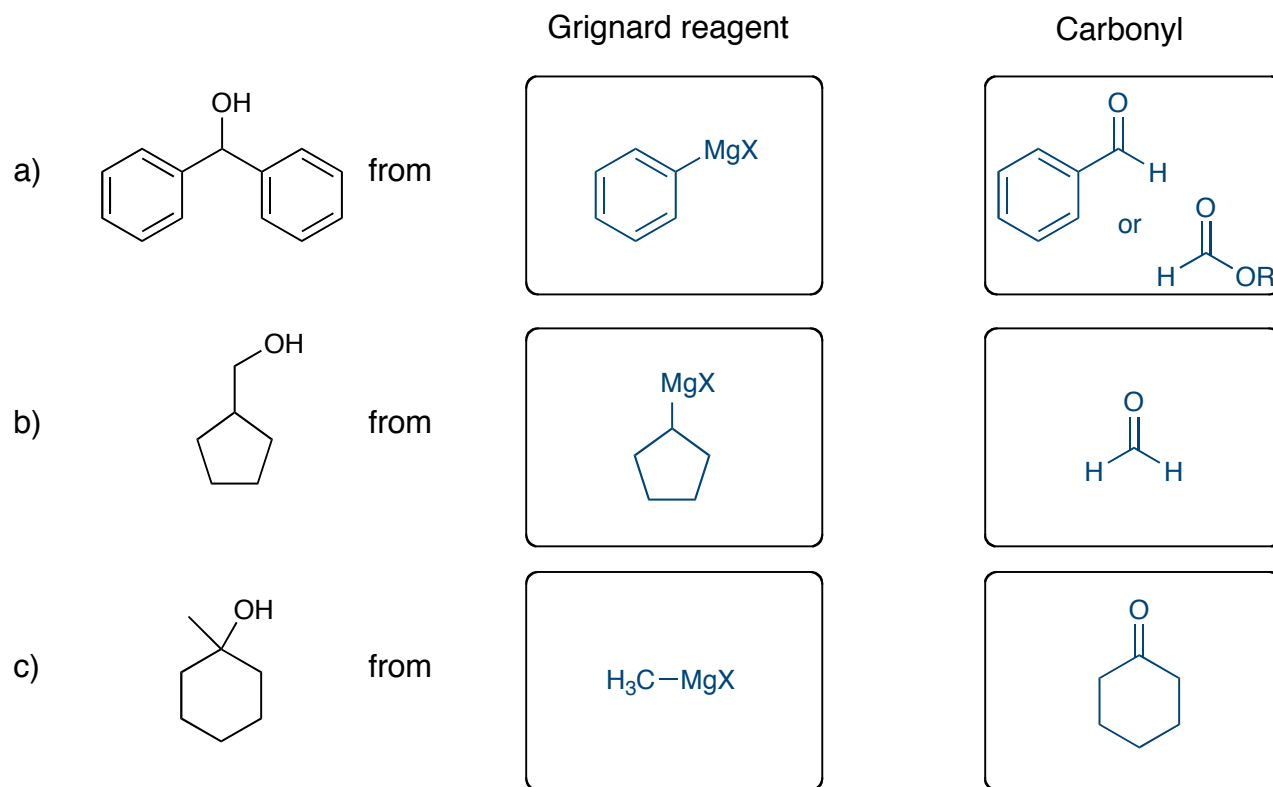
5. Some of the following reactions will not proceed as written. Circle the reactions which *WILL* work. (8 pts)



6. Draw the products for the following reactions. (21 pts)



7. To prepare the alcohols below by nucleophilic addition to a carbonyl, what Grignard reagent and carbonyl compound would you start with? (18 pts)



8. The following reactions all involve the cleavage of an ether (breaking a C-O bond). Draw the product or products of the following reactions. (15 pts)

