

CHT 212
Exam II

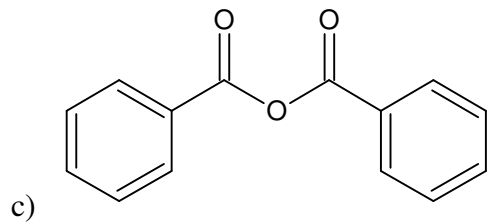
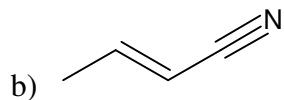
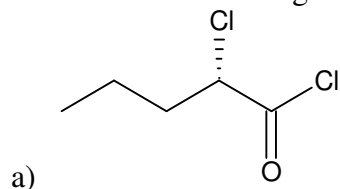
1. Draw the structure of each compound.

a) 3-nitrobenzoic acid

b) isopropyl butanoate

c) 2-methylpropanamide

2. Provide an unambiguous, systematic name for each compound.



3. N-isopropylethanamide can be prepared by reaction of isopropylamine with acetic anhydride, acetic acid, or acetyl chloride. Assuming that all reactions are carried out at the same temperature, rank these three reactions in terms of increasing rate.

4. Esters can be hydrolyzed in water to the corresponding alcohol and acid in either acidic or basic conditions.

a) Propose a mechanism for the saponification of methyl benzoate in aqueous sodium hydroxide.

b) Barring other chemical considerations like the sensitivity of some functional groups to acid or base, it is generally preferred to hydrolyze esters in base rather than acid. Why?

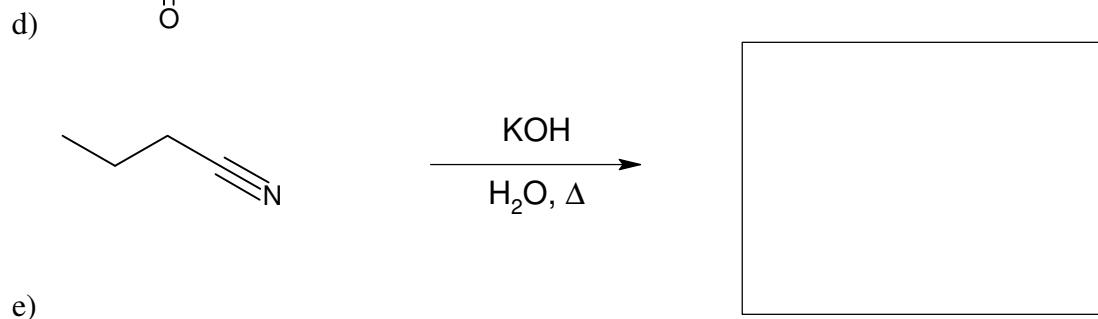
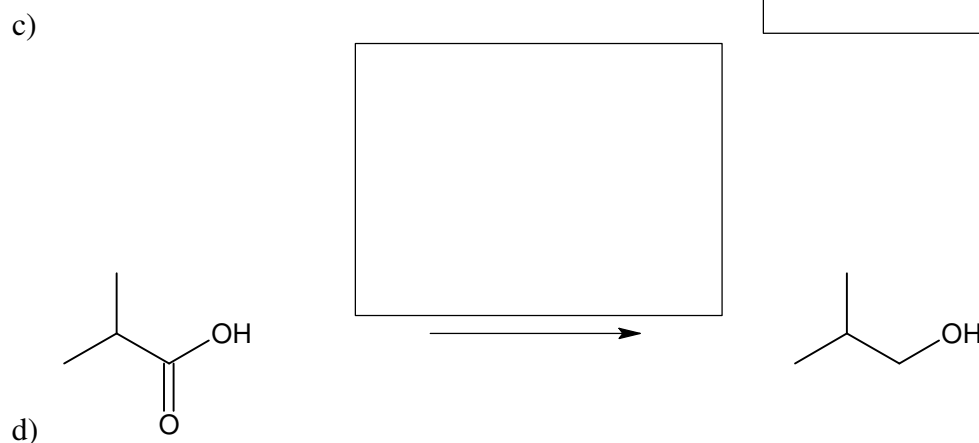
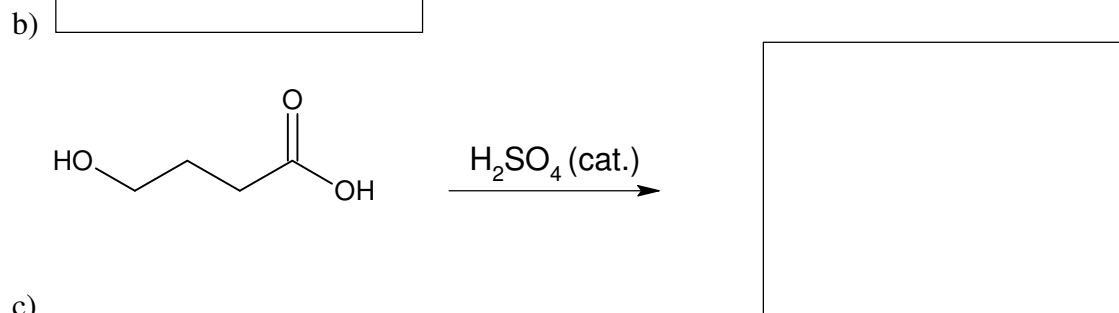
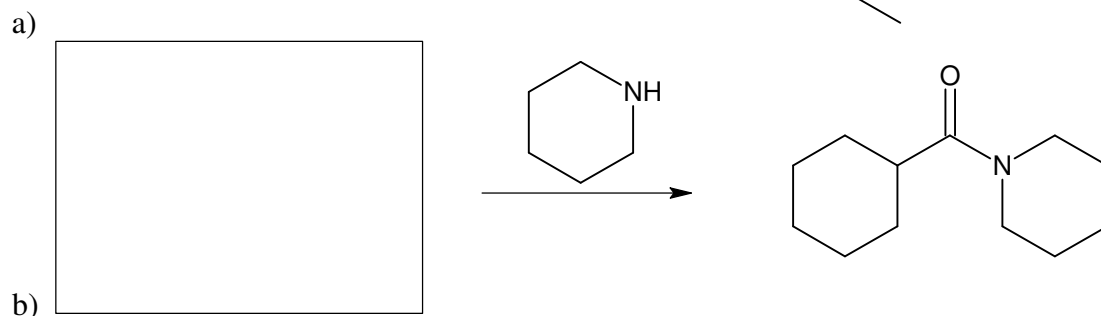
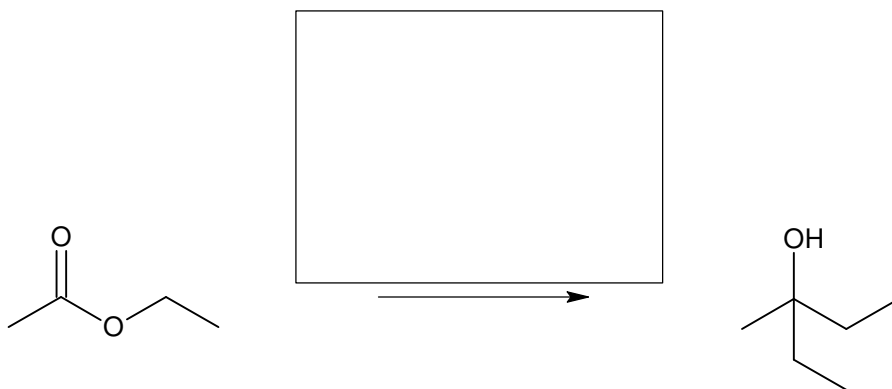
5. The acid dissociation constants for several compounds are provided:

<u>Compound</u>	<u>pK_a</u>
benzoic acid	4.204
<i>p</i> -nitrobenzoic acid	3.441
<i>p</i> -hydroxybenzoic acid	4.582

a) Rank the compounds in terms of increasing acidity and explain your answer.

b) How would the acidity of *p*-fluorobenzoic acid and *p*-methylbenzoic acid compare to these three compounds? Explain.

6. Fill in the blanks with the appropriate reactant, reagents, or product.



7. Propose a synthesis of the following compounds, starting from alcohols of four or fewer carbons, benzene, toluene, and any necessary inorganic reagents.

