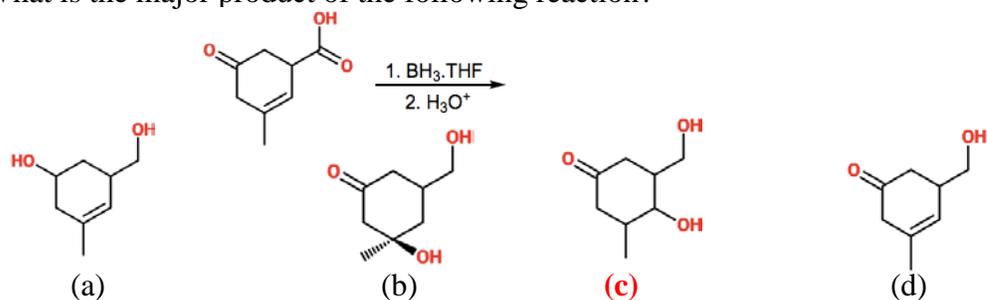


Multiple Choice Questions:

1. What is the major product of the following reaction?



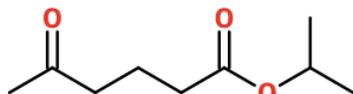
2. Why do carboxylic acids have considerable higher boiling points compared to their alcohol, aldehyde, or ketone counterparts

- (a) They have more acidic protons
- (b) Can form hydrogen dimers**
- (c) Have more oxygens than the other compounds
- (d) The carbonyl carbon is more electrophilic
- (e) None of the above

3. What is the correct order of carboxylic acid derivative stability? (Most Stable > Less Stable)

- (a) Esters > Anhydrides > Acid Chlorides**
- (b) Acid Chlorides > Esters > Amides
- (c) Anhydrides > Amides > Esters
- (d) Amides > Anhydrides > Esters
- (e) None of the above

4. What is the IUPAC name of the following compound?



- (a) 6-isopropylester-2,6-hexandione
- (b) isopropyl 2,6-hexandioate
- (c) isopropyl hexanoic anhydride
- (d) 1-methylethyl 5-oxo-hexanoate**
- (e) None of the above

5. What is the best reagent for the following reaction?

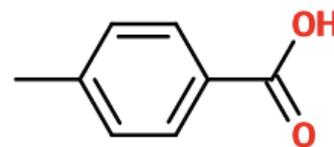
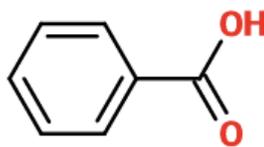
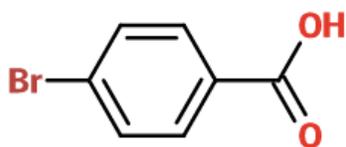
- (a) CH_2N_2 in ether
- (b) NaOCH_3
- (c) H_2SO_4 and $\text{CH}_3\text{CH}_2\text{OH}$**
- (d) $\text{CH}_3\text{CH}_2\text{Li}$
- (e) Two or more will work



6. What of the following reactions would produce an anhydride?

- (a) An amide with carboxylic acid
- (b) Heating a 1,5-pentadioic acid**
- (c) A carboxylic acid with Tollen's and LiAlH_4
- (d) An ester with carboxylic acid and grignards
- (e) Two of the above will work

7. Rank the following in acidity? (Most Acidic > Least Acidic)



- (a) I>III>II
- (b) II>III>I
- (c) III>II>I
- (d) I>II>III**
- (e) Not Listed

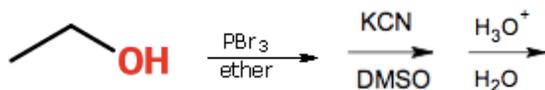
8. A 1:1 equivalent Grignard Reaction with ester produces what product? 2:1 ratio?

- (a) Ketone; 3° Alcohol**
- (b) 2° Alcohol; 3° Alcohol
- (c) Carboxylic Acid; 3° Alcohol
- (d) Aldehyde; Carboxylic Acid
- (e) None of the above

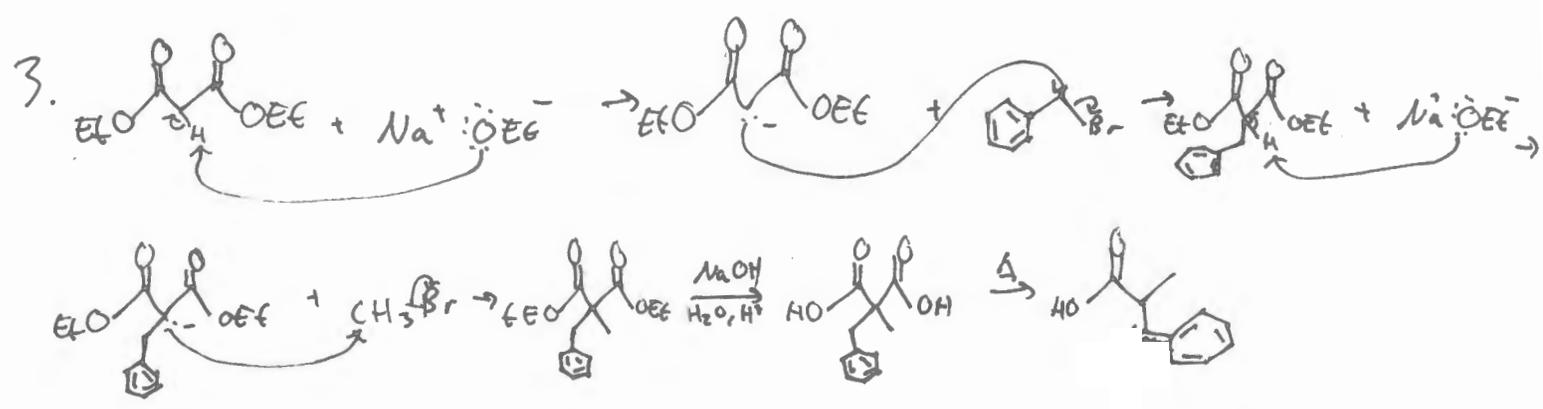
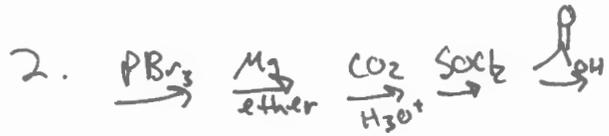
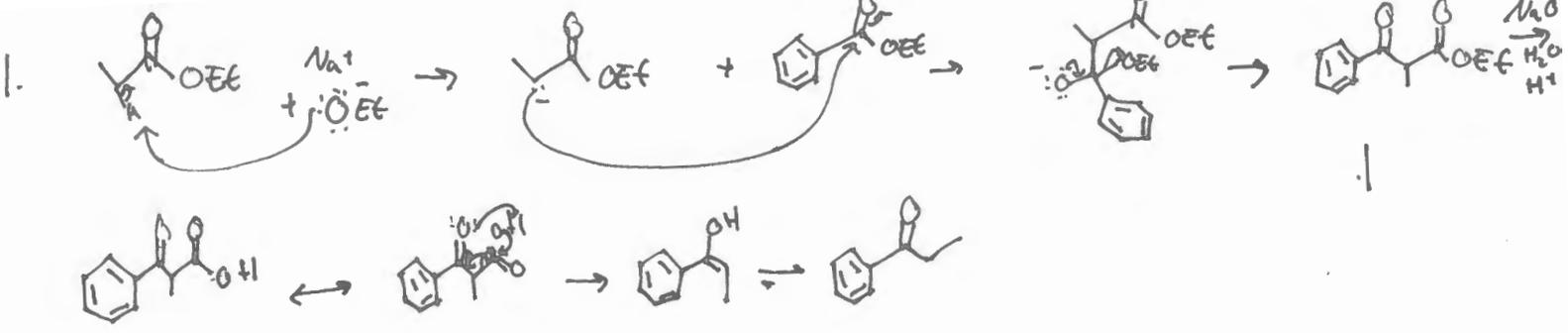
9. What is the product when you react 4-hydroxyl-butanoic acid with sulfuric acid?

- (a) Ketone
- (b) Diol
- (c) Anhydride
- (d) Lactone**
- (e) None of the above

10. What is the product after the following reactions?



- (a) Carboxylic Acid**
- (b) Amide
- (c) 1° Amine
- (d) 1° Alcohol
- (e) None of the above



4. Need a base such as pyridine to quench the HCl byproduct of the acid chloride and alcohol. If HCl is not quenched, the acid could cause saponification which would produce a carboxylate anion rather than the desired ester.

