CHE 202/204 Spring 2011

Midterm Exam-3

April 16, 2011

Name (Please Print): _____

Person #: _____

CHE (202 or 204): _____ Section (B & C): _____

Signature: _____

Problem	Maximum points	Actual points
1.	48	
2.	16	
3.	12	
4.	10	
5.	10	
6.	12	
7.	10	
8.	12	
9. (extra credit)	10	
	Total maximum 140	Your total

1. Circle the correct answer: (48 pts)

(1) When a carbonyl group is part of a conjugated π-network, the C=O bond is:

a. longer than that in a nonconjugated system.

b. shorter than that in a nonconjugated system.

c. the same as that in a nonconjugated system.

e. none of the above.

(2) Compared to ketones, aldehydes react in _____ rates in nucleophilic addition reactions

a. the same

b. slower

c. faster

d. different

(3) When the carbonyl group of a ketone is protonated:

a. the resulting species can react with both weak and strong electrophile(s).

b. the resulting species can react with both weak and strong nucleophile(s).

c. the resulting species only reacts with strong acid.

d. the resulting species does not react at all.

(4) The reagent which converts a carbonyl group of a ketone into a methylene group is:

a. Na, NH_3, CH_3CH_2OH.

b. $NaBH_4$, CH_3CH_2OH.

d. BH_3-THF.

e. $LiAlH_4$.

(5) Compared to an alkene C=C bond, a carbonyl double bond has:

a. higher polarity.

b. lower polarity.

c. the same polarity.

d. no polarity.

(6) What reagent can be used to convert a carboxylic acid to a ketone?

a. water.

b. NaOH.

c. $LiAlH_4$.

d. an organolithium (RLi).

(7) Carboxylic acids boil at considerably higher temperatures than do alcohols, ketones, or aldehydes of similar molecular weights. This is because they:

a. have a greater oxygen content.
b. are more acidic.
c. form stable hydrogen-bonded dimers.
d. are hydrophobic.

(8) Nucleophilic acyl substitution is a reaction involving:

a. aldehydes.
b. ketones.
b. carboxylic acids and their derivatives.
d. any compounds containing the carbonyl group.

(9) Typically, esters will hydrolyze under _____ conditions than amides.

a. stronger
b. more dilute
c. less rigorous
e. milder

(10) Amides are much less basic than amines because:

a. the carbonyl group donates electrons by resonance.
b. the carbonyl group withdraws electrons by resonance.
c. the nitrogen does not have a lone pair of electrons.
d. the nitrogen has a full positive charge.
e. amides do not contain nitrogen.

(11) Nitriles (R-CN) are considered to be carboxylic acid derivatives because:

a. they share the same general structure with the other derivatves.
b. they also contain the carbonyl group.
c. they are always prepared from esters.
d. they can be converted into both amide and carboxylic acids.

(12) The reactivity of carboxylic acid derivatives decreases as leaving group becomes

a. smaller
b. larger
c. less basic
d. more basic