

Chem 141  
Fall 2005  
Exam 2 alternate  
10/18/05

NAME: \_\_\_\_\_

LAB SECTION  
(Time, Day and TA): \_\_\_\_\_

Problems	Pages	Points	Grader
	_____	_____	_____
	_____	_____	_____
	_____	_____	_____
	_____	_____	_____
	_____	_____	_____

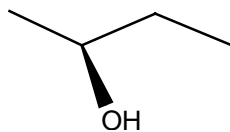
TOTAL \_\_\_\_\_points

% \_\_\_\_\_

1. Give the full name for each of the following compounds and include the R/S configurations where appropriate.

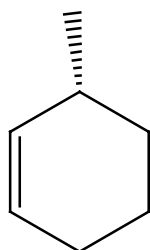
2 points each

a)



2-butanol

b)



3-methyl-cyclohexene

c)



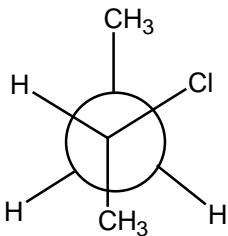
2-methylcyclohexanol

d)



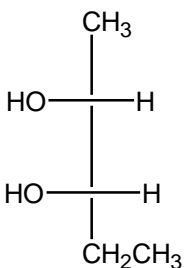
methylcyclopropane

e)



2-chlorobutane

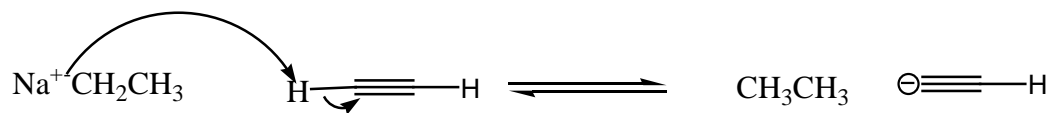
f)



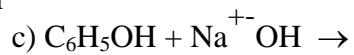
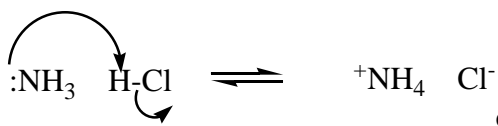
2,3-pentan-diol

2) Provide the products for the following acid/base reactions. Provide arrows to illustrate the flow of electrons and charges where appropriate. 3 points each

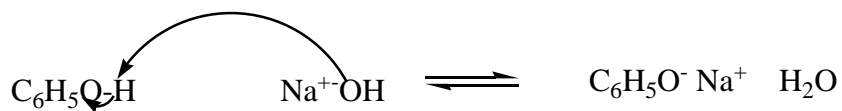
a)



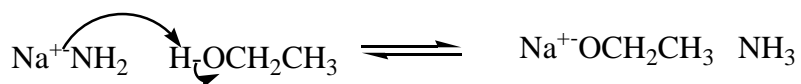
b)



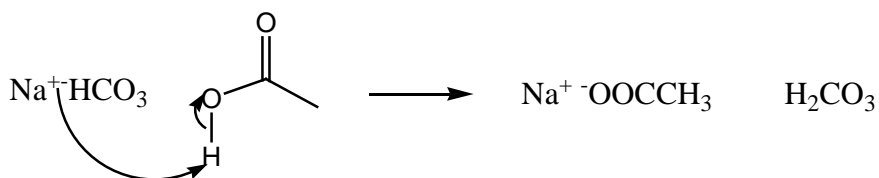
c)



d)



e)



f)



3) Number the following compounds in order of acidity (1 most acidic to 5 least acidic).  
4 points

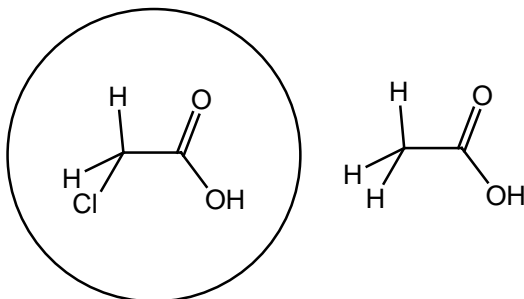
Methane (CH<sub>4</sub>)      \_\_4\_\_

Water (H<sub>2</sub>O)      \_\_2\_\_

Hydrofluoride (HF)      \_\_1\_\_

Ammonia (NH<sub>3</sub>)      \_\_3\_\_

4) Which compound has a lower pKa (circle) and mention in a sentence the effect which is responsible for the increased acidity. 3 points

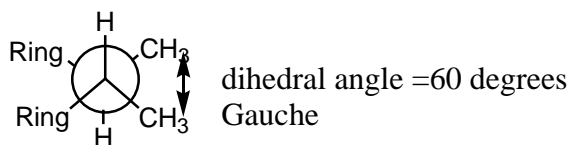


The inductive effect pulls electron density through the sigma bonds to increase the acidity of the carboxylic acid due to the high electronegativity of the chloride.

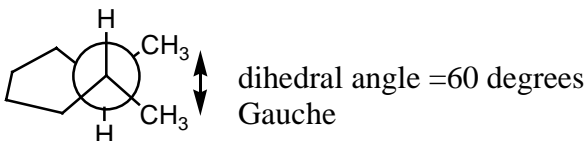
5) Why is it important to consider the solvent when using strong acids or bases involved in organic reactions? 2 points

Solvents may be more reactive (acidic or basic) than the reactants of interest and may out compete for the acid or base used.

6) Draw a Newman Projection between the 1<sup>st</sup> and 2<sup>nd</sup> carbons of the following cyclohexane. What named relationship would best define the two methyl substituents? What is the dihedral angle between these substituents? 4 points



or



7) A regular pentagon apex angles of  $108^\circ$ . Why does the energy minimized conformation distort the bond angles away from this near ideal  $sp^3$  hybridized bond angle? 2 points

A cyclopentane will distort the bond angles of one carbon (pucker that corner) to relieve the torsional strain of the eclipsed hydrogens.

8) What are the reactants, reagents and products of the following reactions? Fill in the gaps on top of either the blank line or the empty arrow. 2 points each

