# Chem 1124 Exam 3.  December 2, 2011

**Name**_____

useful information:  M = (moles of solute)/(L of solution),mM = (mmol solute)/(L of solution), % = solute/solution x 100%,  ppm = (mass solute)/(mass of solution) x $10^6$, ppb = (mass solute)/(mass of solution) x $10^9$,

(1)(3 points)  Classify the following as a solution, a suspension, or a colloid

(a) homogenized milk

(b)  filtered sea water

(c)  muddy river water

(2) (4 points)  What is a saturated solution?

(3) (4 points)  If a sample of water is placed under 3 atm pressure of $CO_2$, what will happen to the amount of $CO_2$ dissolved in the water?  Why?

(4)(4 points)  What is the difference between a strong electrolyte and a weak electrolyte?

(5)(6 points)  A solution is 5% (m/v) in glucose.

(a)  How much glucose is in 1.50 L of the solution (in g)?

(b)  How many moles of glucose is in 1.50 L of solution?

(c) What is the concentration in molarity?

(6)(4 points)  When salt is added to ice on a sidewalk, it often melts.  Why?
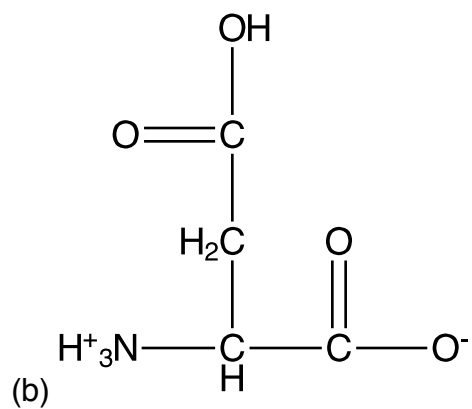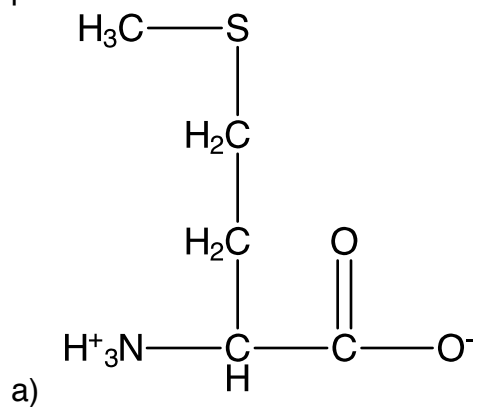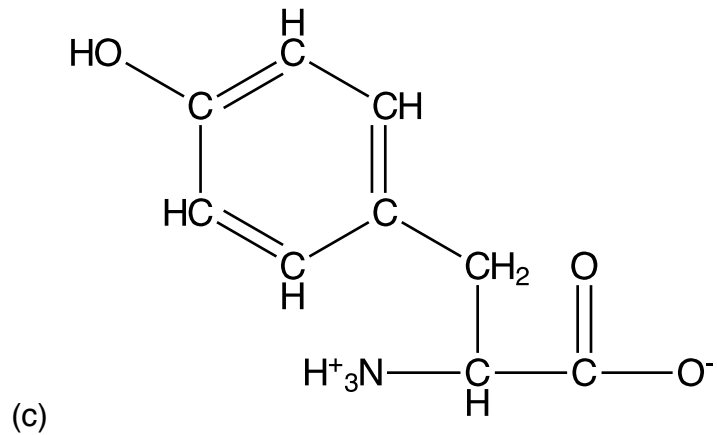
(7)  Define the following:

(a) Arrhenius Acid

(b) Arrhenius Base

(8)(2 points)  What is the pH of a 0.00100 M solution of HCl?

(9)(2 points)  What is the $[H_3O^+]$ of a solution with a pH = 9.00?

(10)(3 points)  Label the following amino acids as acidic, basic, nonpolar, or neutral and polar.

$H_3C$——$S$

$H_2C$

$H_2C$    $O$

$H^+_3N$——$C$——$C$——$O^-$

a)         $H$

$OH$

$O$=$C$

$H_2C$    $O$

$H^+_3N$——$C$——$C$——$O^-$

(b)        $H$

HO

H
C
C
CH
HC
C
C
H
CH$_2$
O
H$^+_3$N—C—C—O$^-$
H

(c)

(11)(4 points)  Sketch a cartoon picture of a β-pleated sheet.  What holds the protein in this arrangement?

(12) (4 points)  What is the difference between reversible and irreversible inhibition of an enzyme (pointing out that one is reversible and the other one isn't is not sufficient)?

(13)(4 points)  How do heavy metal ions denature proteins?