Chapter 19 WS

A/B Strength, Neutralization, & Salts

Name: _____

Period: _____ Date: _____

1) When talking about solutions, what do the words "strong" and "weak" actually represent?
   Strong = Weak =

2) What is the generic formula for the acid dissociation constant (K_a) for the generic acid HA?

3) Acids with a large K_a are considered _____ acids because they are _____ ionized, and acids with a small K_a are _____ acids because they are _____ ionized.

4) What is the generic formula for the base dissociation constant (K_b) for the following base?

5) Bases with a _____ K_b are considered _____ bases because they are highly ionized, and bases with a _____ K_b are _____ because they are slightly ionized.

6) What would be the K_a or K_b for the following acids if the following are equilibrium concentrations?

   a. $H_2CO_3 \rightarrow H^+ + HCO_3^-$
   $[H_2CO_3] = 2.00M, [H^+] = 9.80 \times 10^{-6}, [HCO_3^-] = 9.80 \times 10^{-6}$

   b. $H_2S \rightarrow H^+ + HS^-$
   $[H_2S] = 8.25M, [H^+] = 9.08 \times 10^{-4}M, [HS^-] = 9.08 \times 10^{-4}M$

   c. $NH_3 + H_2O \rightarrow NH_4^+ + OH^-$
   $[NH_3] = 0.250M, [NH_4^+] = 2.12 \times 10^{-3}M, [H^+] = 2.12 \times 10^{-3}M$

   d. $H_2NNH_2 + H_2O \rightarrow H_2NNH_3^+ + OH^-$
   $[H_2NNH_2] = 0.120M, [H_2NNH_3^+] = 8.76 \times 10^{-4}M, [OH^-] = 8.76 \times 10^{-4}M$

7) What are the products of acid/base reactions?

$$Acid + Base \rightarrow \_\_\_\_\_ + \_\_\_\_\_$$

8) What is the equivalence point of a titration?

9) What is the end point of a titration?

10) What is the formula for calculating titrations?

11) What is the normality of the following acids and bases?

a. 2.0 M NaOH

b. 1.0 M H_3PO_4

c. .5 M $Ca(OH)_2$

d. 1.5 M H_2SO_4

12) Calculate the missing part of each of the following titrations:

a. 25 mL of 1.0 M H_2SO_4 is titrated with 40 mL of NaOH. What is the concentration of the NaOH?

b. 3.0 L of Sulfuric acid is titrated with 1.0 L of 1.0 M $Al(OH)_3$. What is the concentration of the acid?

c. 10. mL of 0.50 M HCl titrates 50. mL of an $Al(OH)_3$ solution. What molarity is the base?

d. 7.5 L of a 1.0 tetra-protic acid is titrated by a 3.0 M KOH solution. What volume of base is needed?

13) In some instances, adding a salt to water will turn the solution into an acid or a base. There are 4 basic rules for predicting the acidity, basicity, or neutrality of a solution when a salt is added… what are they?

a.

b.

c.

d.

14) If the K_a of ethanoic acid (CH_3COOH) is 6.40×10^{-5}, what would be the concentration of hydrogen ion in a 0.300 M solution of ethanoic acid?

a. Write the equation for the dissociation of ethanoic acid:

b. Calculate the initial concentration, change in concentration, and final concentration of all three parts of the dissociation equation:

c. Write the formula for K_a, substitute in your final concentrations from part b, and then solve for your unknown amount… You are gonna need the quadratic formula for this one!

15) Determine which acids and bases the following salts hydrolyze into and then determine whether the resulting solution will be acidic, basic, or neutral:

a. NaCl

b. $(NH_4)_3PO_4$

c. $Mg(C_2H_3O_2)_2$

d. K_2CO_3